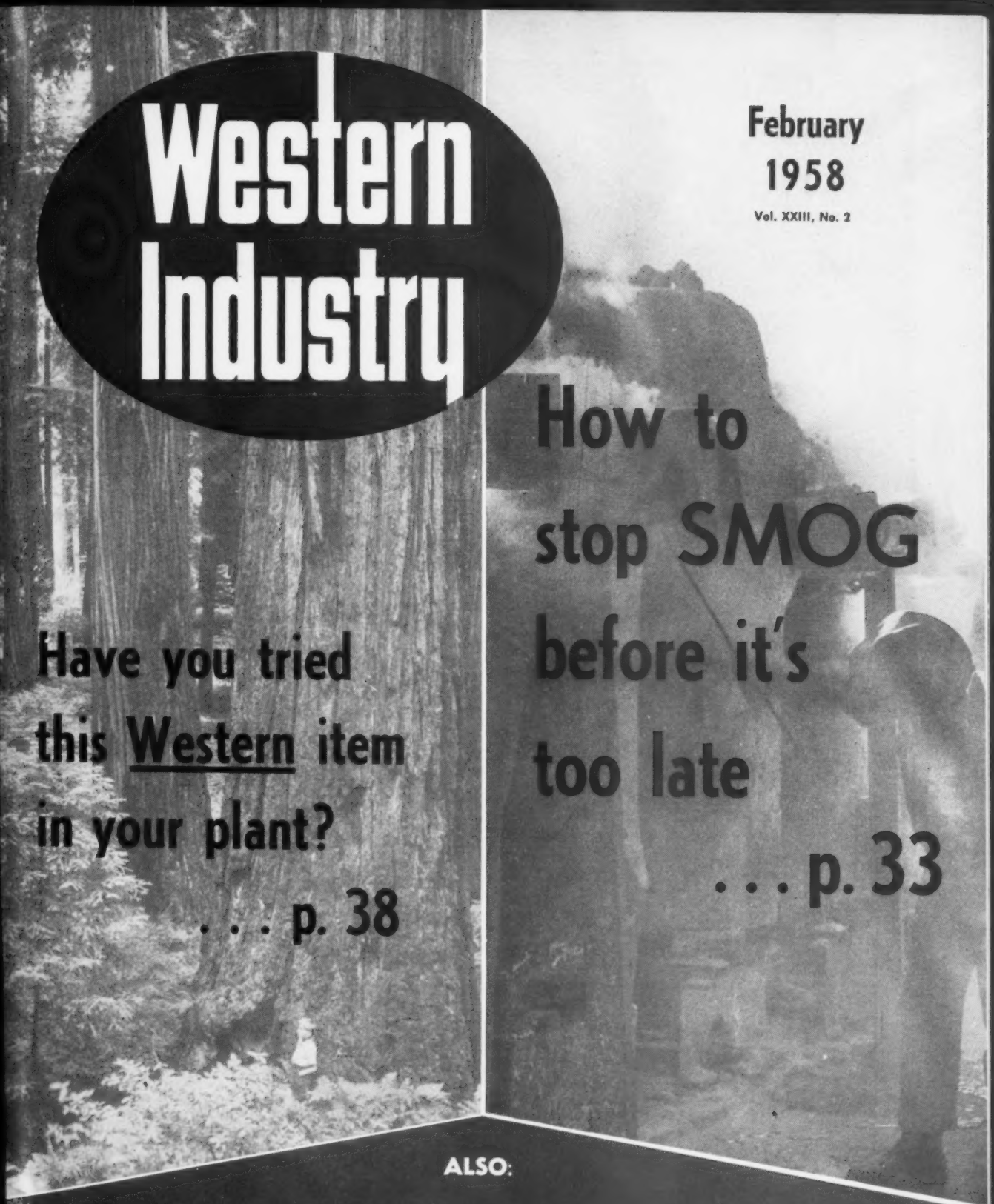
Western Industry

February
1958
Vol. XXIII, No. 2



How to stop SMOG before it's too late

. . . p. 33

Have you tried this Western item in your plant?

. . . p. 38

ALSO:

Automation handling 36
Production home runs 40
Cost reduction book 47
Manuals on abrasives 65

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3 tiers of cylinder head forgings, 16 forgings to a tier, make a sum total of 48. But secured to a pallet by the Stanley "Uni-Tie" Method, all 48 become ONE compact package, easier for this Cleveland manufacturer to handle, store and ship. Using the Stanley Electric Skid Magazine Power Tool, every strap is effortlessly and speedily *power*-tightened to the same pre-determined tension, so there's no danger of the strapping loosening or the load shifting.

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This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • metal parts • coatings • steel and steel strapping—made in 24 Stanley plants in the United States, Canada, England and Germany

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MONARCH SOLIDS

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KING PUBLICATIONS

FEBRUARY, 1958
Vol. XXIII, No. 2

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An exclusive WESTERN INDUSTRY interview with Benjamin Linsky, air pollution control officer of the San Francisco Bay Area.

Automatic handling leads the way to automation 36
This Western plant also achieved integration when it installed an overhead conveyor system. It can work in your plant.

Have you tried this Western product in your plant? 38
Yes, you'll be surprised when you find out all the ways this unique Western product can be used.

Batting ideas to score "home runs" 40
That "screwy" idea of yours may pay off handsomely. This firm "brainstormed" its way to real savings in time and money.

When you boost production, give handling a lift 42
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New assembly equipment saves $150,000 43
By adding here and there to work stations, this aircraft firm reaped big rewards. Try it and see.

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Bringing us up to 101 time and money saving ideas under Western plant operating conditions.

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L. V. Wilson

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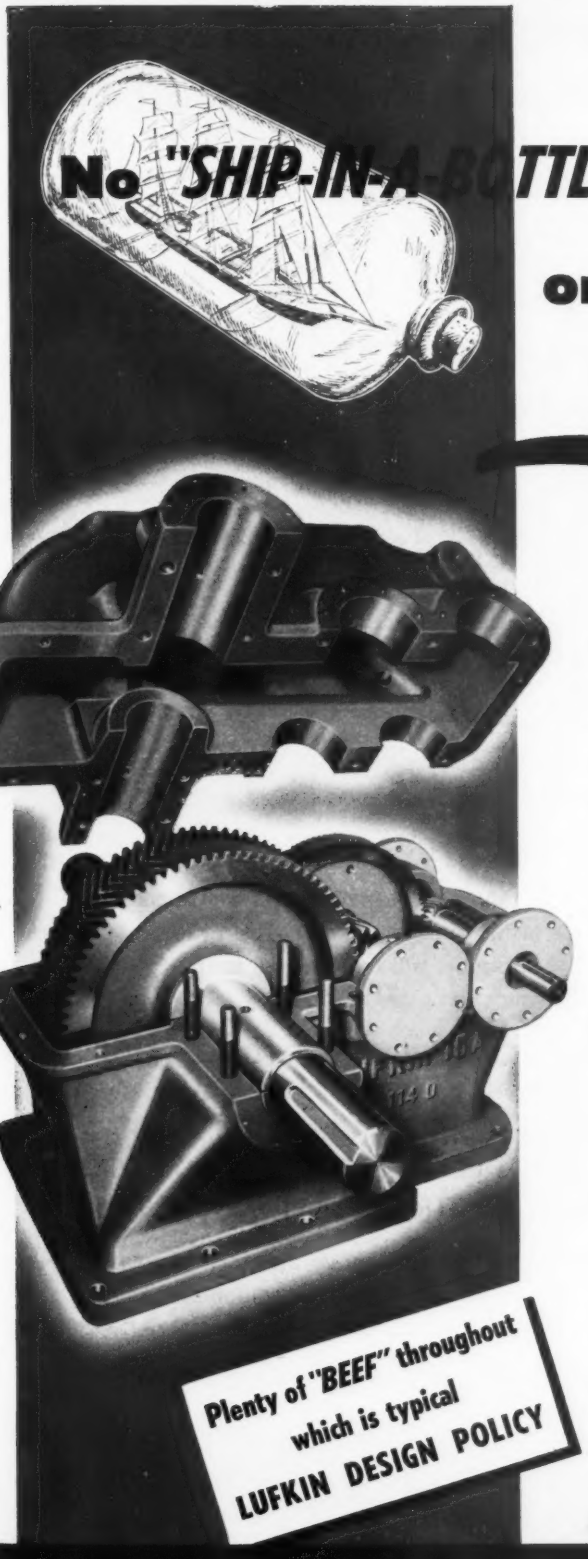
The Essential Publication for Manufacturing Management in the New Industrial West



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Provides easy accessibility for assembly and inspection

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- Large Clean Out Hole for removing sludge from bottom of box.

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Exhibit & Conference

SPONSORED BY WESTERN AIR CONDITIONING INDUSTRIES ASSOCIATION

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MAY 7-11, 1958

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this will be a selling show. Quality prospects will attend from the Nation's fastest growing market—the 11 Western States. Top-level industry personnel will be attracted to the well-integrated technical program and display.

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Come...See and talk to manufacturers and their representatives ...compare the lastest advances in Air Conditioning, Heating, Ventilating and Refrigeration equipment and accessories.

Take advantage of the excellent program of technical sessions.

After 1958, this Exhibit will be presented biennially
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Fred J. Tabery, Exhibit Manager
Western Air Conditioning Industries Association
3443 South Hill Street, Los Angeles 7, California
RIchmond 9-1091

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UNITED offers you the world's largest 365-m.p.h. cargo lift, because every DC-7 in the fleet carries 9000 pounds of air freight. Add to this the hefty capacity of United's DC-6A Cargoliners plus the extra cargo space on *every* passenger Mainliner® and you have the most flexible air freight service available. And when you ship United, you take advantage of such features as Reserved Air Freight (guaranteed space), direct airways to 80 cities, door-to-door service and fleet-wide radar dependability. Also, you enjoy the close co-operation that's a matter of pride with United, where extra care is basic policy.

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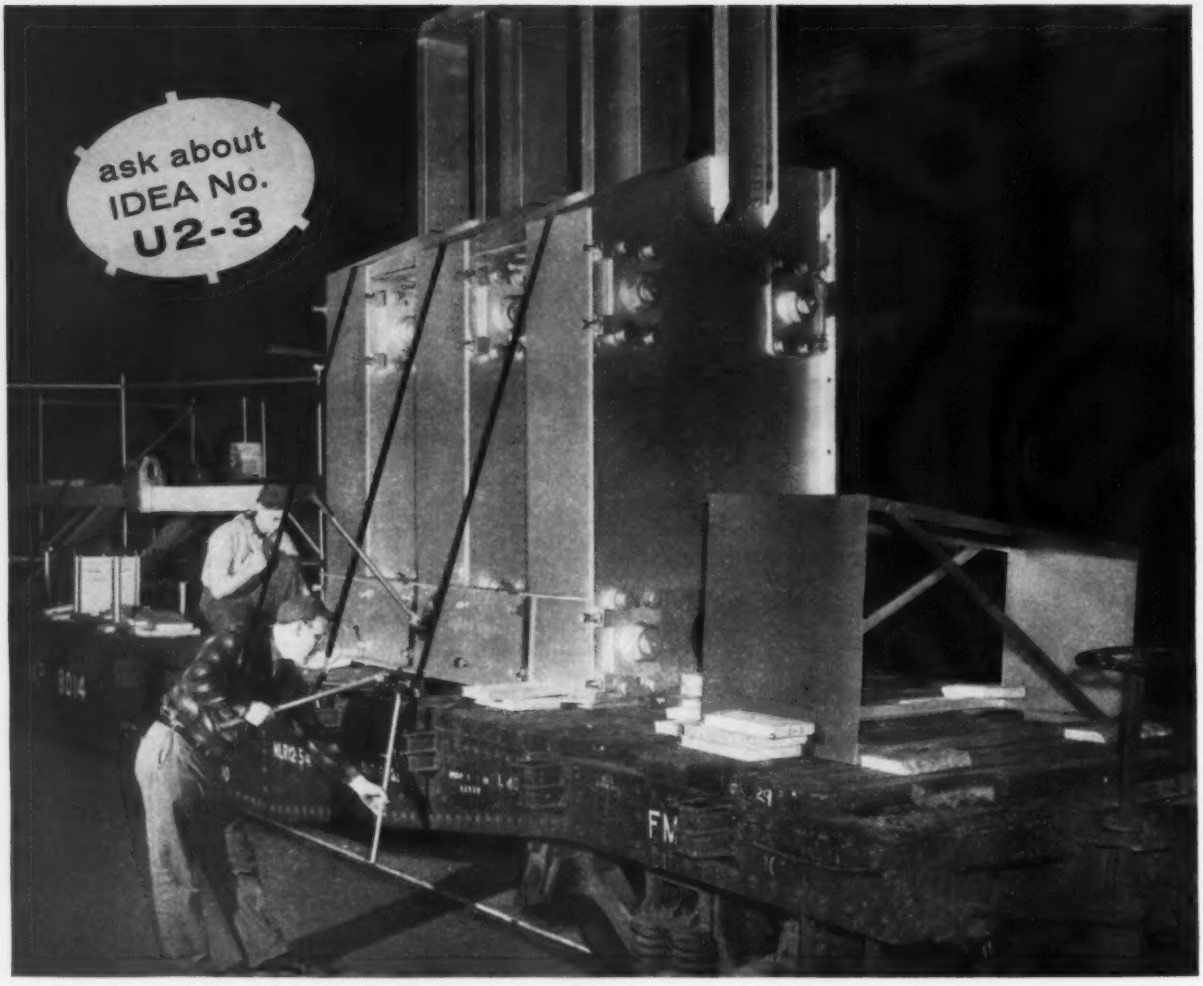

Consult your AIM*. . . Whiting Corporation does . . .

Acme Steel Strapping protects electric furnace shipment

When the world's largest electric copper melting furnace left the shops of its manufacturer, Whiting Corporation, Harvey, Illinois, it was securely braced and protected for flatcar shipment with heavy-duty Acme Steel Strapping. It arrived without damage, shifting, or delays en route for securement adjusting. (Idea No. U2-3)

Whiting Corporation relies on heavy-duty Acme Steel Strapping to tie-down and protect rail shipments of all heavy industrial machinery and equipment it manufactures. Shipments are loaded and secured with steel strapping in less than half the time required by the former method of using threaded steel rods that had to be shaped to fit the loads. And a crew of only two men, instead of three, can do the job, releasing a man for other plant duties.

Acme Idea Man Andy Bassi helps Whiting Corporation solve its carloading problems.

***Consult your Acme Idea Man** for advice on ways to better protect your products for handling, shipping, storage. His Ideas-in-Action files contain scores of performance-proved Ideas that can be adapted to meet your needs. Write Dept. WCU-28 Acme Steel Products Division, Acme Steel Company, 4901 Pacific Boulevard, Los Angeles 58, California. Also San Francisco, Seattle, Portland.

ACME STEEL STEEL STRAPPING

. . . for more details, circle No. 6 on Reader Service Postcard

Penetrates through rust
like coffee soaks into a sugar cube!

How much do you spend on removing rust before you paint? Why not coat right over the sound rusted metal with Rust-Oleum 769 Damp-Proof Red Primer after simple scraping and wire-brushing to remove rust scale and loose rust . . . saving time, money, and metal! Rust-Oleum's specially-processed fish oil vehicle penetrates* through rust to bare metal—while the surface film remains *tough, firm,* and *durable.* You cut costly surface preparations, you receive nearly 30% greater coverage depending upon the condition and porosity of the surface—and you receive the *maximum* in over-the-years protection!

Whatever your color choice may be—Rust-Oleum finish coatings include the color you want. They're manufactured under the same *exclusive* formulation as the Rust-Oleum Primer . . . they assure you of *greater* compatibility, *double* protection, and *lasting* beauty! The best way to see what Rust-Oleum will do for you is to actually try it yourself . . . around your plant or home.

See our complete catalog in Sweets, or send the coupon for a free Rust-Oleum Test Sample . . . one brushful means *more* than a thousand words. Prompt delivery from Industrial Distributor stocks.

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- ☐ 30-page report on Rust-Oleum penetration
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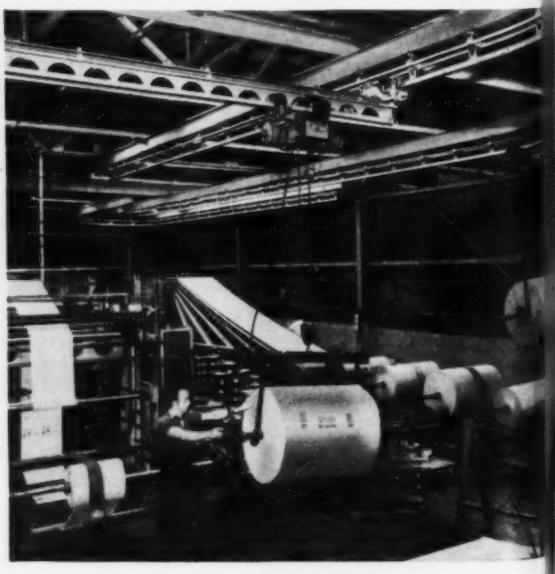
In The West It's Cleveland

INSPIRATION, ARIZONA—Rather than use a conventional heavy top-running crane in their flotation mill, the **Inspiration Consolidated Copper Co.** installed a 3-ton cab-operated Cleveland Tramrail crane for servicing the hydro-separators, sumps and other equipment. The tramrail crane and runway are far lighter in weight, thereby effecting a large savings in crane, as well as supporting structure. It has ample rigidity and is built with a safety factor of five. Greater convenience in handling is obtained because the right end of the crane interlocks with a spur track enabling loads to be transferred directly to a swinging jib crane in the next bay. Speeds are: bridge 150 f.p.m., trolley 33 f.p.m., hoist 100 f.p.m.

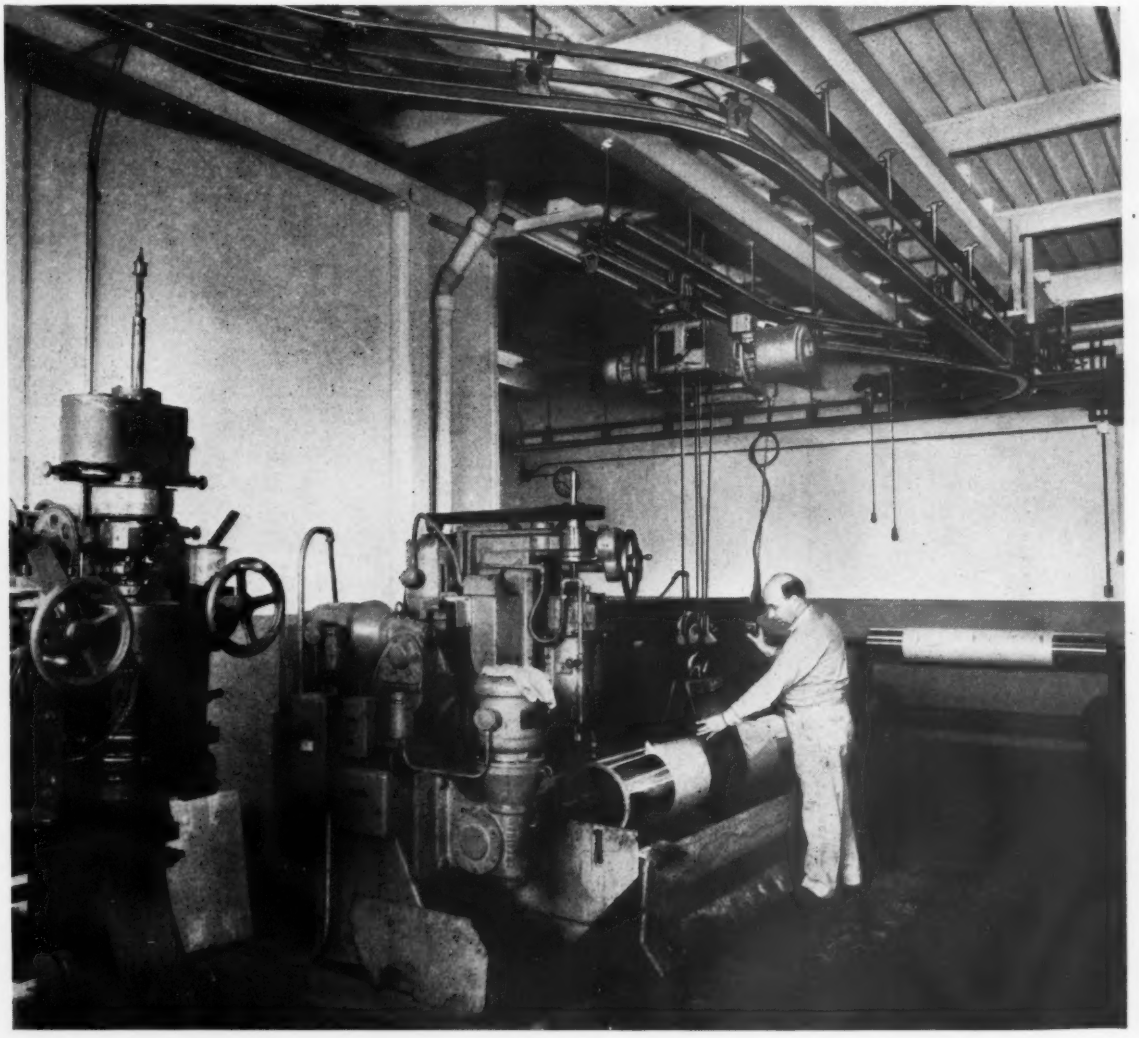
PORTLAND, OREGON—Three 3-ton, 67'-0" long Cleveland Tramrail cranes on adjacent runways have been in constant service since installed 18 years ago in the warehouse of **Woodbury Hardware Co.** They provide fast, efficient handling for a tremendous variety of hardware. Two or three of the cranes can be interlocked, as required, to permit traveling loads from one to another. Photo shows two cranes interlocked hoisting a load through the hatchway from floor below.



Tramrail

NEARLY EVERY WESTERN INDUSTRIAL COMMUNITY HAS EXTENSIVE INSTALLATIONS OF CLEVELAND TRAMRAIL OVERHEAD MATERIALS HANDLING EQUIPMENT IN USE

LOS ANGELES—Copper gravure cylinders used for printing are heavy and must be handled with extreme care for the slightest dent or scratch can mar fine printing. At the Los Angeles plant of **Alco-Gravure**, Division of Publication Corporation, 2,000,000 copies of "This Week Magazine" are printed every week for distribution in West Coast newspapers. Gravure cylinders for this work are handled through the various steps with 3000 lb. hand-propelled carriers and electric hoists over a Cleveland Tramrail track and switch system. Illustrated is a 1650 lb. cylinder being placed in a grinder.



BERKELEY, CALIF.—Cleveland Tramrail equipment plays a prominent role in the production of multi-wall paper bags at the **Ames Harris Neville Co.** The crane at left is handling a printed roll from the press. The hoist at right is placing a roll (48" wide, 1152 lbs. wt.) into the creel of a tuber. The Tramrail equipment is so easy rolling that only the hoists are electrified.

Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.

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334 West 17th South Street
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CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 8841 E. 290 ST. • WICKLIFFE, OHIO

. . . for more details, circle No. 8 on Reader Service Postcard

ONE OF THE FOREMOST ELECTRICAL insulation authorities, **Graham Lee Moses,** is slated to head up one of the conference sessions sponsored by the Electrical Maintenance Engineers Association of Southern California, March 28th, at Shrine Exposition Hall, Los Angeles.

Moses' presentation on "Electrical Insulation—Basic Concepts and Proper Maintenance"—will be part of a well-integrated three-day technical program, including daytime and evening sessions on Thursday and Friday, March 27 and 28, with additional sessions on Saturday morning, March 29. This program is combined with the EMEA's 9th Biennial Electrical Industry Show, featuring exhibits by over 200 leading manufacturers of electrical equipment and accessories.

Moses has been a design engineer since 1923, was in charge of insulation design and development for Westinghouse Electric Corporation since 1937 and is currently responsible for maintenance studies and methods developments for larger rotating apparatus. He is the author of more than 150 technical papers and articles and a book "Electrical Insulation."

Other featured speakers include **Edwin M. Brose,** Estimatic Corporation of Denver, Colorado, who will discuss the modern way of estimating by use of IBM equipment; **Hugh Diamond,** manager of sales service section of Bulldog Electric Products Co. of Detroit, Michigan, who will cover the subject of fusible devices and their application; **H. E. Pike,** sales manager of Chase Shawmut Company of Newburyport, Mass., and **Frank Huttinger,** chief application engineer for the Small Circuit Breaker Division of the I. T. E. Circuit Breaker Co. of Philadelphia, who will cover other areas of activity in the protective devices field; **P. E. Fisher,** Western regions manager, service shops department, General Electric Company, San Francisco, who will discuss rotating equipment —AC & DC Motors & Generators.

Expected to attract particular attention is the session on the maintenance of electronic equipment, in view of the increasing use of this type of equipment. Authorities in all phases of this technique, which includes counters, timers, motor controls, spot welders, induction heaters, will be present to answer questions of the conferees.

According to **Fred J. Tabery,** Exhibit Manager for the EMEA, more space has already been reserved for the display of the latest developments in the industry than there has been at show time in any previous exhibit.

A complete schedule of the conference program may be obtained by writing Electrical Maintenance Engineers Association, 1052 W. 6th Street, Los Angeles, California, and exhibit information may be acquired from Tabery at 3443 So. Hill Street, Los Angeles, 7.

●

DR. LILLIAN GILBRETH, New York City, internationally-known consultant on industrial engineering, will be keynote speaker at the 3rd annual Packaging and Materials Handling Conference April 4 and 5 at the University of California, Berkeley, **Robert O. Swendsen,** chairman of the organizing committee, announced.

The Conference, sponsored by the Bay Area chapters of the American Materials Handling Society and the Society of Industrial Packaging and Materials Handling Engineers, in cooperation with the Department of Engineering, University of California, is expected to attract some 400 industrialists who have problems brought about by constantly changing methods within their industry.

Dr. Gilbreth, who has been written about in leading industrial publications, is one of the leading authorities in her profession and the committee feels fortunate in securing her as a speaker, Swendson said. A complete program will be mailed, with an invitation to attend, well in advance of the conference opening. Advance registrations may be made with Swendsen, East Bay Municipal Utility District, 2127 Adeline St., Oakland, Calif.

●

THE SECOND WELDING, BRAZING AND HEAT TREATING SHOW will be held March 27, 28 and 29 in San Jose. Sponsoring group is the Santa Clara Valley section of the American Welding Society.

The show is timed in cooperation with the First Western Welding, Brazing and Heat Treating Conference sponsored by the Golden Gate Chapter of the American Society for Metals, to be held March 27 and 28 at Stanford Research Institute in nearby Menlo Park.

County Fair Grounds in South San Jose will be the scene of the Second Welding Show. Around 50 exhibits will be featured, along with live displays and demonstrations of all welding processes . . . including weld inspection, heat treating and allied metal working tools. There will be displays of equipment, as well as a photographic panorama of large welded products from the area and an exhibit of heavy weldments and welded machinery made in Santa Clara Valley.

AIPE WESTERN REGIONAL VICE PRESIDENT

A. W. Kissner, manager of the Plant Engineering department of the Ford Motor Co. assembly plant at San Jose, has been elected Western Regional Vice President of the American Institute of Plant Engineers. Kissner is active in the San Francisco area chapter of the AIPE.

●

"NEW PRODUCTS AND NEW INDUSTRIES THROUGH RESEARCH" will be the theme of the fourth Western Area Development Conference on May 26-27 in Vancouver, British Columbia. The conference is sponsored by Stanford Research Institute.

Topics to be covered at the meeting include: Area Development and Research; Nucleonics—A New Industry; Research as a Basis of Industrial Growth; Canada Seeks New Industry; and the Significance of the Common Market. Also, the Expanding Petrochemical Industry; New Uses and New Markets for Gas; Petroleum Supply and Demand in the West, and the Research Approach. Each of these subjects will be discussed by an au-

. . . continued on page 18

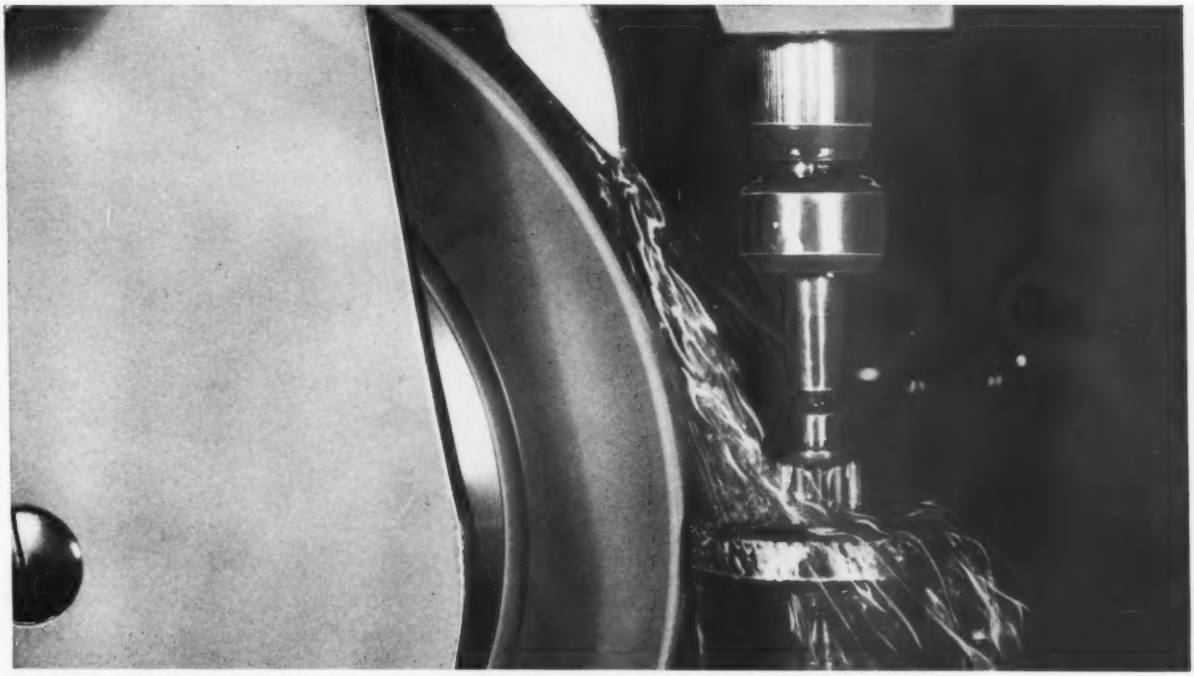
AIIE—Seattle. President **Henry Thomson, Jr.,** presents plaques of appreciation for service to the chapter. Left to right: past presidents **Edward R. Fish, Jr.; Alf J. Rorstad, Henry Thomson, Jr.**

STANDARD ENGINEER'S FIELD REPORT

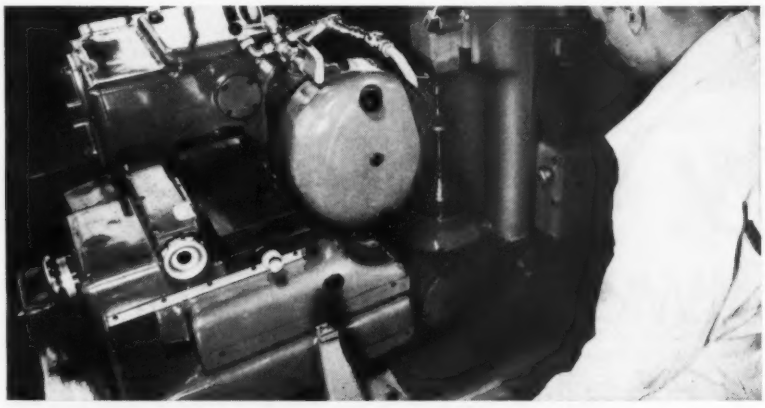
PRODUCT CHEVRON CUTTING FLUIDS

FIRM WESTERN GEAR CORP. Lynwood, Calif.

Chevron Cutting Oil prevents missile gear burning

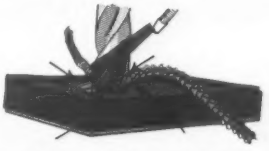


Chevron Cutting Oil (formerly Calol) keeps this 1800-rpm abrasive wheel from burning guided missile control gears as they are ground to close tolerances on Reishauer precision grinder. Western Gear Corporation tried various other lubricants, finally settled on this economical Cutting Oil (210TA) because it eliminates burning during high-speed precision grinding.



Swiss-made Machine controls grinding by speed of spindle and pressure of work against constant speed abrasive wheel. On gear shown, total of accumulated spacing error between any two teeth is .0001". High cooling and lubricating qualities of Chevron Cutting Fluids help make this accuracy possible. They do not separate, turn rancid, let work rust.

Why Chevron Cutting Fluids solve metal-cutting problems



- Have high cooling and lubricating qualities—increase tool life
- Assure precision finishes
- Additives protect against extreme pressure, corrosion and rust
- Very stable—will not separate or turn rancid
- Specialized products for every metal-cutting operation

For More Information contact your Standard Engineer or Representative, or write 225 Bush Street, San Francisco 20, California

CHEVRON Industrial Lubricants

TRADEMARK "CHEVRON" AND DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA

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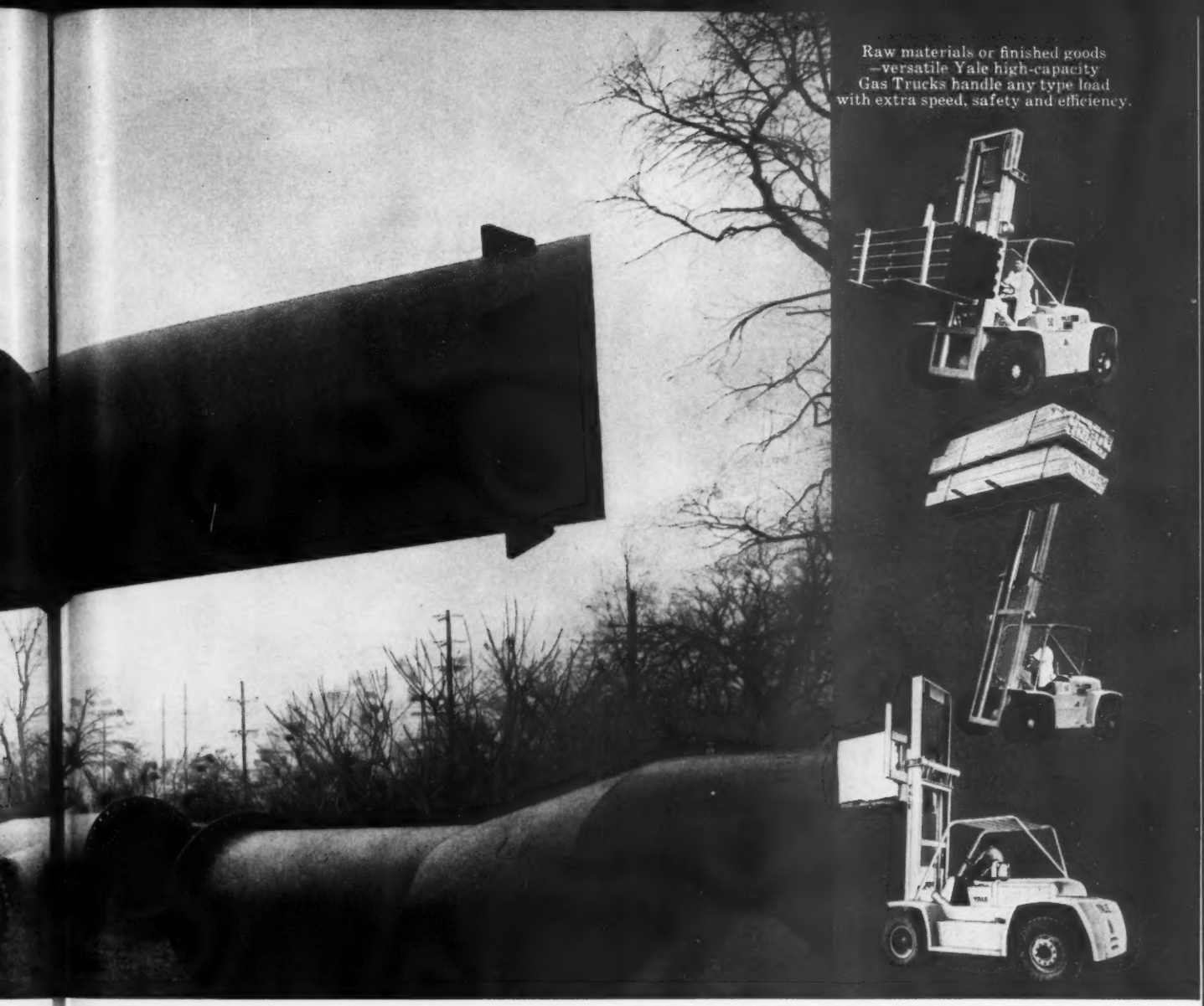
Ambrose-Augusterfer Corporation has been awarded the contract for all major piping in Torresdale Filter Plant —now under construction in N.E. Philadelphia. Pipe being handled weighs over 10,000 lbs. and measures 40' by 54" in diameter.

Only Yale G-3 Gas

1. Wide Angle vision
2. Fast cycle operation
3. Greater load stability

BUILT IN THE WEST for WESTERN INDUSTRY

Now full visibility, extra safety and handling speed for efficient, big-load operations...at low cost



Raw materials or finished goods —versatile Yale high-capacity Gas Trucks handle any type load with extra speed, safety and efficiency.

s Trucks give you all 3

Maximum visibility, easy maneuverability, high speeds, safe stability—you'll find the combination of all these vital features exclusively in new Yale G-3 Series High-Capacity Gas Trucks.

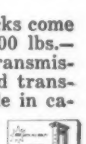
Wide-Angle Vision—Yale's revolutionary open-front design reduces frontal obstruction. Upright channels are nested—hoisting cylinders wide-spaced—lifting chains located in front of cylinders, out of line of sight. Driver sits high in center—has 300% more visibility!

Fast Cycle Operation—Yale G-3 Gas Trucks maneuver quickly into position ...lift capacity loads at speeds up to 60 feet a minute...travel as fast as 20 m.p.h....spot loads accurately. This fast, smooth operation keeps materials on the move, saves time and handling dollars.

Greater Stability—Low center of gravity, broad lifting base, high underclearance, side-thrust rollers, wide channel-roller spacing, large pneumatic tires—these and many other features that assure load stability are *standard* on Yale High-Capacity Gas Trucks.

Yale G-3 Gas and LP-Gas Trucks come in capacities of 15,000 to 20,000 lbs.—with fully automatic torque transmission, fluid coupling or standard transmission. Complete line available in capacities of 2,000 to 20,000 lbs.

Get the full story. Send for your free copy of Bulletin #5230. The Yale & Towne Mfg. Co., Philadelphia 15, Pa., Dept. A-262.



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INDUSTRIAL LIFT TRUCKS AND HOISTS

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GASOLINE, ELECTRIC, DIESEL & LP-GAS INDUSTRIAL LIFT TRUCKS • WORKSAVERS
WAREHOUSERS • HAND TRUCKS • HAND AND ELECTRIC HOISTS

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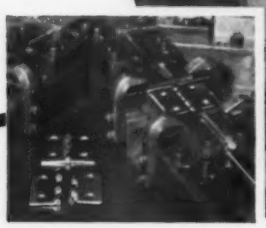
How
DENISON
MULTIPRESS
serves the
HARDWARE
INDUSTRY



Economical assembly of hardware hinges *is accomplished at low cost at Jaybee Mfg. Corp., Los Angeles, California. Multipress and table cycle at rates up to 2500 an hour to pace assembly operation.*

Assembles 2500 parts an hour at **JAYBEE** Mfg. Corporation with **DENISON** Hydraulic Multipress

Building hardware is being assembled here at rates of 2000 to 2500 units an hour, depending on size. Operators have only to load component parts. An indexing fixture with air operated clamps carries parts to the pressing station . . . holds them and sets rivets.

Because of its hydraulic ram operation, the Multipress is quickly and easily set for each type and size of hinge to be assembled. And since the ram pressure is duplicated exactly on every stroke, damage to assemblies through improper loading is eliminated, cutting scrap and saving material and labor cost.

Whether your work is light or heavy, small or high production, there is a Multipress from 1 to 75 tons that can save now on expensive operations in your plant. Have your Denison representative show you how. Write Denison Engineering Division, American Brake Shoe Co., 1184 Dublin Road, Columbus 16, Ohio.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

DENISON HydrOILics

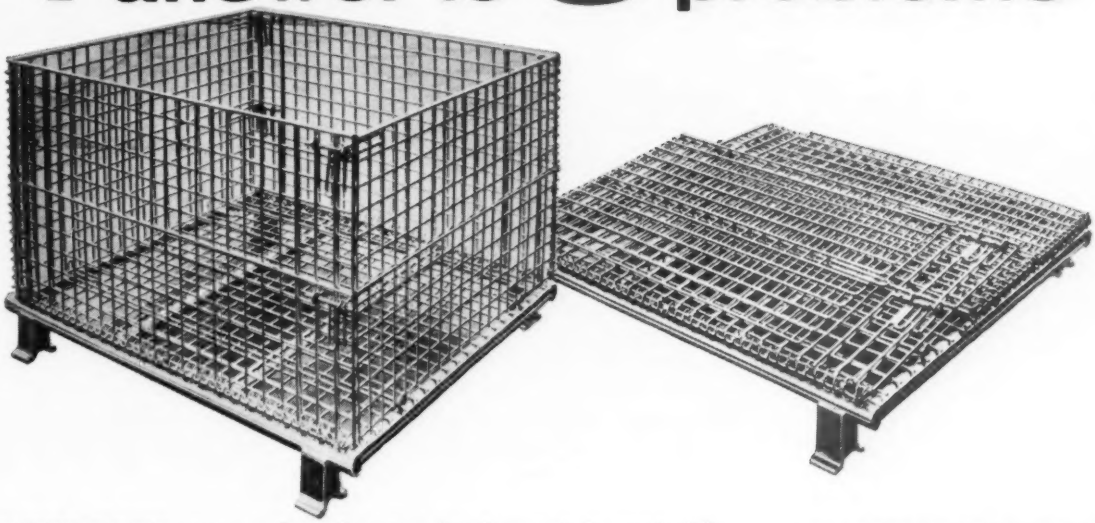
Denison, Denison HydrOILics, and Multipress are registered trademarks of Denison Eng. Div., ABSCO

. . . for more details, circle No. 11 on Reader Service Postcard

CF&I KARGO-PAL

TRADE MARK

1 answer to 3 problems



CF&I KARGO-PALS are a relatively new development in materials handling containers—yet more and more users are enthusiastic about their time- and money-saving benefits. By making it possible to handle 1- to 2-ton loads of parts with a fork lift truck these pallet-type collapsible containers cut handling costs in three spots in your plant operation.

KARGO-PALS SAVE HANDLING TIME

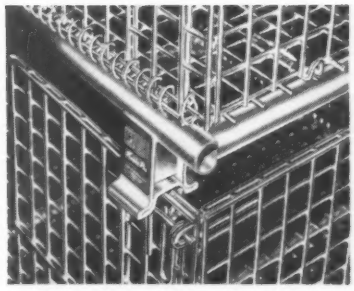
1 **IN DELIVERIES TO YOUR PLANT.** You furnish suppliers with folded Kargo-Pals. They set them up and fill them with sorted parts. You *both* save time in loading and unloading of trucks or box cars.

2 **IN SUB-ASSEMBLY OPERATIONS.** Stored parts are clearly visible and can be brought to assembly points in the Kargo-Pal container in which they were received. In many plants, completely assembled units are stored in Kargo-Pals for shipment.

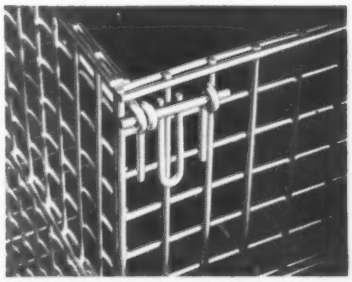
3 **IN STORAGE.** When not in use, Kargo-Pals are quickly and simply folded and stacked for compact storage. Folded Kargo-Pals can be returned to suppliers for one-fourth of the fourth class freight rate.

In addition, Kargo-Pals eliminate the maintenance and replacement costs associated with wooden crates, drums and other out-moded containers. For Kargo-Pals are made of sturdy 2″ mesh, 2 gage (.2625″) Welded Wire Fabric with a corrosion-resistant baked aluminum finish.

Get the complete details on the many cost-cutting benefits of Kargo-Pals from your CF&I representative or write 1080 19th Ave., Oakland 6, California.



KARGO-PALS welded pipe base, special interlocking leg construction and strong, helical hinges permit safe fork lift pickup, stable stacking and compact storage when empty.



Specially designed locks (two per side) automatically fall into locked position. Accidental opening is practically impossible.

CF&I KARGO-PAL

THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Kansas City • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland
Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

5667

. . . for more details, circle No. 12 on Reader Service Postcard

Western Meeting Reports

continued from page 12

thority in his field.

Further information may be obtained from **Charles L. Hamman**, Economics Research Division, Stanford Research Institute, Menlo Park Calif.

•

A SERIES OF PANELS on "Executive Development" is scheduled by the Los Angeles chapter of the Society for the Advancement of Management (SAM) at 6:30 p.m. on the third Thursday from March through June at the Rodger Young Auditorium. Men interested in management are cordially invited.

Special meeting topics are: March 20—"The Role of SAM in Executive Development." Speaker will be **Harold R. Bixler,** National Executive Vice President of SAM.

April 17—"Executive Development in Government Agencies"—panel of leading civic officials will be lead by **John Leach,** past president of SAM.

May 15—"The Financial Executive Considers Executive Development"—panel led by **H. Pearson,** controller of O'Keefe and Merritt.

June 19—"The Marketing Department's Experience in Executive Development"—panel of leaders from the petroleum industry.

•

THE ASSOCIATION OF IRON AND STEEL ENGINEERS will hold its first annual Western meeting on Feb. 24, 25 and 26 at the Hotel Statler in Los Angeles.

Technical sessions to be held the first two days of the meeting will offer papers by leading steel mill authorities on topics of particular interest to Western steel producers. These papers will include such subjects as automatic numerical data logging and processing; static control for blast furnaces; a modern forging press and its control; immersion thermocouple practice; electrical equipment for a modern sheet temper mill.

An informal stag dinner is scheduled for Tuesday, February 25, in the Pacific Ball Room of the Hotel Statler.

The three-day meeting will be concluded on Wednesday, February 26, with an inspection trip to the Harvey Aluminum Company and Harvey Machine Co. plant at Torrance, Calif.

Individuals associated with the iron, steel and allied industries, whether or not they are members of the AISE, are invited to attend the meeting. There is no registration fee.

•

THE PAPER MILL MEN'S CLUB of Southern California recently elected the following officers: President, **Richard A. McDonald, Jr.,** Paper Products, Inc.; Vice President, **C. A. Meginniss,** Star Paper Co.; Secretary **Harry W. Granger,** Oregon Pulp & Paper Co.; and Treasurer, **Jack Courtney,** Crown Zellerbach Corp.

•

BEHAVIOR OF NEW CORROSION RESISTANT NON-FERROUS METALS in chemical industry applications will be featured during the Chemical Industry Symposium at the 14th Annual Conference and Exhibition of the National Association of Corrosion Engineers.

The conference will be held March 17-21, with most meetings and exhibition held at the Civic Auditorium, San Francisco. The symposium will have 12 papers in three sessions.

"DOWN TO EARTH PRACTICAL APPROACHES TO MATERIAL HANDLING"—the theme of the 1958 Western Material Handling Conference, May 8 and 9 in Los Angeles—is discussed by the general chairman of the conference and moderators for three of the conference sessions. Left to right: **Andrew J. Briggs,** The May Co., moderator of the session on warehousing operational techniques; **Robert J. Muth,** Electric Storage Battery Co., general conference chairman; **Clyde E. Hinckley,** The Market Basket, moderator of the session on receiving and shipping operations; **W. B. Semco,** W. B. Semco & Associates, moderator of the session on material handling equipment selection and use. Not shown is **Vincent Palmer,** Vincent Palmer & Associates, moderator for the session on planning and space lay-out for material handling.

SPEAKER FOR THE NIGHT—Capt. W. C. G. Brouwers (left), president of the Northern California chapter of SIPMHE, congratulates **Willard Melziner,** president of the Impact-O-Graph Corp. of Cleveland, who spoke before a joint meeting of the Northern and Central California chapters of the SIPMHE.

"SENSITIVITY TRAINING FOR MANAGERS" is the subject of two workshops—one in the San Diego area and the other in Los Angeles area—to be held by the University of California Extension and the UCLA Institute of Industrial Relations.

The San Diego seminar-workshop will meet on successive Monday evenings from March 3 to April 14 at Hotel El Cortez. The Los Angeles workshop will have weekly meetings from April 2 through May 7. Further information may be obtained from University Extension Service in both areas.

•

A FORK TRUCK RODEO is being held next month by the Denver chapter of the American Material Handling Society (AMHS). All companies in Colorado have been invited to send their best operators who have had no accidents during the past six months.

Competitions will include a brief true or false test covering operation, methods of handling loads, safety standards, etc.; and on operating a truck on obstacle course . . . including preliminary safety check, pallet pick-up, offset pallet drop, pallet stacking, zig-zag maneuver, obstacle course, smoothness and safety of operation. Thophies will be awarded winning contestants and sponsoring companies.

•

NEW OFFICERS OF THE ARIZONA chapter of the Society of Industrial Packaging and Materials Handling Engineers (SIPMHE) are:

Chris Seferlis, Hughes Aircraft Co., president; **George Peters,** Reynolds Metal Co., vice president; **Joe Rice,** International Metals Co., secretary; **Les Miller,** Motorola, Inc., treasurer; **Les Nauman,** Nauman Lift Trucks, Inc., program chairman; **Ken Kistler,** Kistler Industrial Service Co., publicity.

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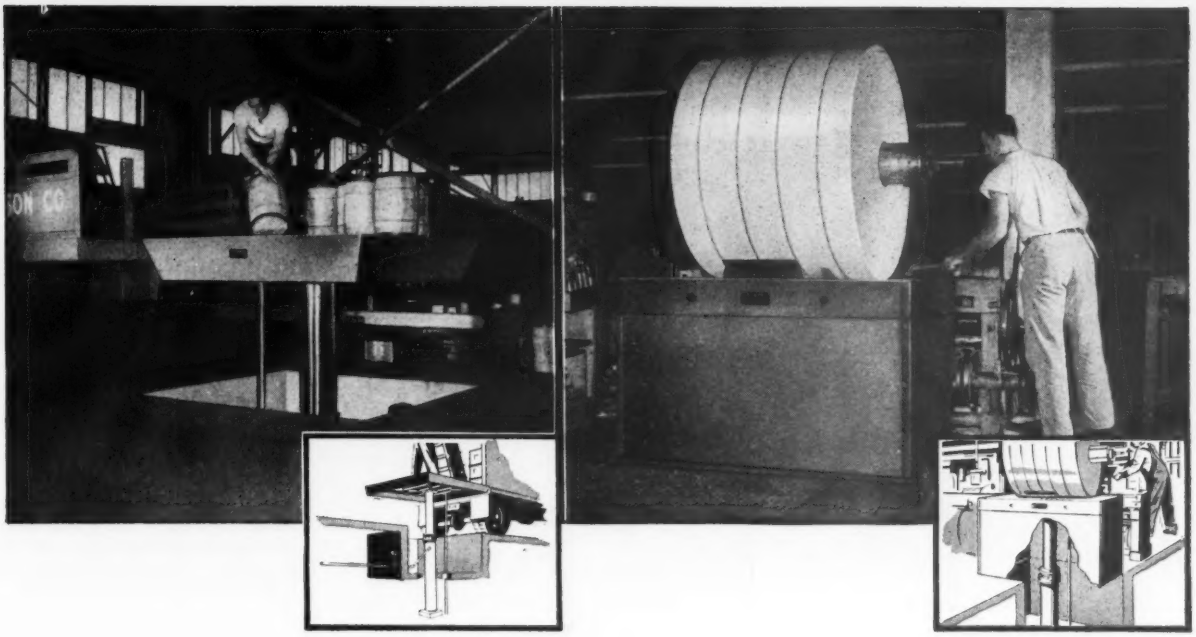
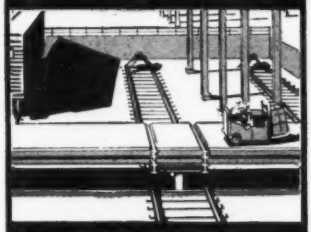


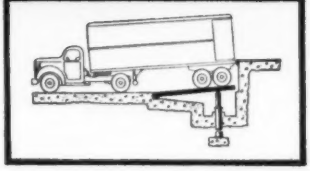
GLOBE MATERIALS HANDLING LIFTS

SIMPLIFY YOUR LOADING

CROSS-OVER BRIDGE LIFTS



TRUCK LEVELERS



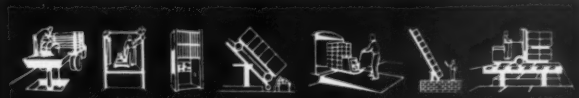
Increase productivity, reduce both down-time and accidents in countless materials handling jobs by using the Globe Loading Lift that best fits *your* need. And Globe has a complete line—Production Lifts, Bridge Lifts, Trans-O-Matic Ramps, Truck Levelers—for any job, large or small. Actual case studies show time savings of from 33 to 50% after Globe Loading Lifts were installed. Breakage is reduced . . . safety increases.

Low cost, standard components are used to tailor-fit any job from 1,000 lbs. to 50,000 lbs., for any lift up to 50 ft. Globe Lifts are easily installed . . . economically operated.

GLOBE®

LOADING LIFTS

PLANTS: DES MOINES—PHILADELPHIA—LONG BEACH, CAL.



Write today for your free copy of "CASE STUDIES IN MODERN LIFTING." Information is also available in Sweet's Plant Engineering Catalog.

GLOBE PACIFIC HOIST COMPANY WI-806P-LL
1461 Canal Avenue
Long Beach 13, California

Please send me more information on Globe Loading Lifts, together with FREE booklet "Case Studies in Modern Lifting."

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COMPANY _____

ADDRESS _____

CITY _____ STATE _____

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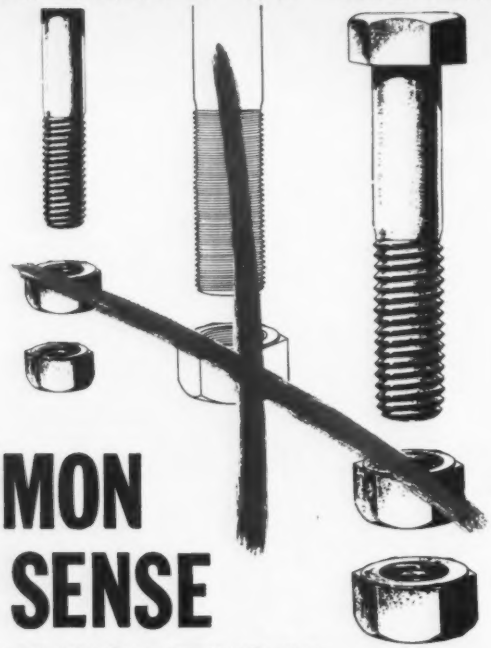
ECONOMIC FACTS ON FASTENERS



COMMON SENSE SIMPLIFICATION CUTS INVENTORY

● Reduce fastener inventory by simplifying usage requirements

● Lower your stock handling and purchasing costs, too

To take full economic advantage of "standard" fasteners, standardize their *usage*, too. The fewer types and sizes you can get along with, the lower your buying, stock handling and even assembly costs will be.

Case history: At one plant, the man tackling the job found more than 23,000 fastener items in inventory. Without need to consult anyone, he eliminated 1700 items immediately. With study, he figures to cut the rest in half.

Some suggestions: (1) Stock *only* one pattern of nut, not two or more, for each size bolt. (2) Use coarse threads almost exclusively; fine threads are seldom necessary. (3) Eliminate as many bolt lengths and diameters as feasible. Change a minor specification rather than add an in-between size. (4) Settle on fewer materials. Two grades of steel satisfy most strength needs. (5) Specify fewer head styles for bolts and screws.

Much simplification can be done by common sense alone; much *more* with the help of a fastener engineer. Ask the RB&W Fastener Man to show you. Russell, Burdsall & Ward Bolt and Nut Company, P. O. Box 3336—Terminal Annex, Los Angeles 54, Calif.

113th year

R B & W

SERVING THE WEST FROM THE WEST

Plants at: Los Angeles, Calif.; Rock Falls, Ill.; Coraopolis, Pa.; Port Chester, N. Y. **Additional sales offices at:** San Francisco; Dallas; Chicago; Detroit; Pittsburgh; Ardmore (Phila.), Pa. **Sales agents at** Denver; Fargo; New Orleans; Milwaukee. **Distributors** from coast to coast.

Staked acorn nuts lock securely

Staking opposite sides of these RB&W acorn nuts deforms threads for a positive grip. It also puts middle of nut slightly out-of-round, for a spring tension locking effect. They're designed for applications such as outdoor furniture, where anchoring fasteners is more important than solid seating. Available in aluminum, steel, silicon bronze.

These all-metal nuts can also be furnished in double chamfered style. Since they lock with their middle threads, they can be turned onto screw from *either* side.

Tapping screws that lock into place

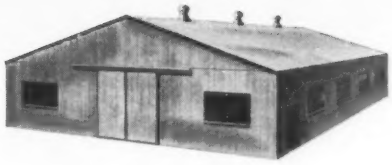
RB&W offers tapping screws with Spin-Lock® design. Hardened teeth on periphery of head lock into seat when screw is tightened. They resist backing off from vibration or thermal expansion and contraction.

In one case, continual heating and cooling had caused handle screws on certain flatirons to loosen. Every type tried failed to stay tight under these conditions, until RB&W's unique Spin-Lock tapping screws were installed. That did it.

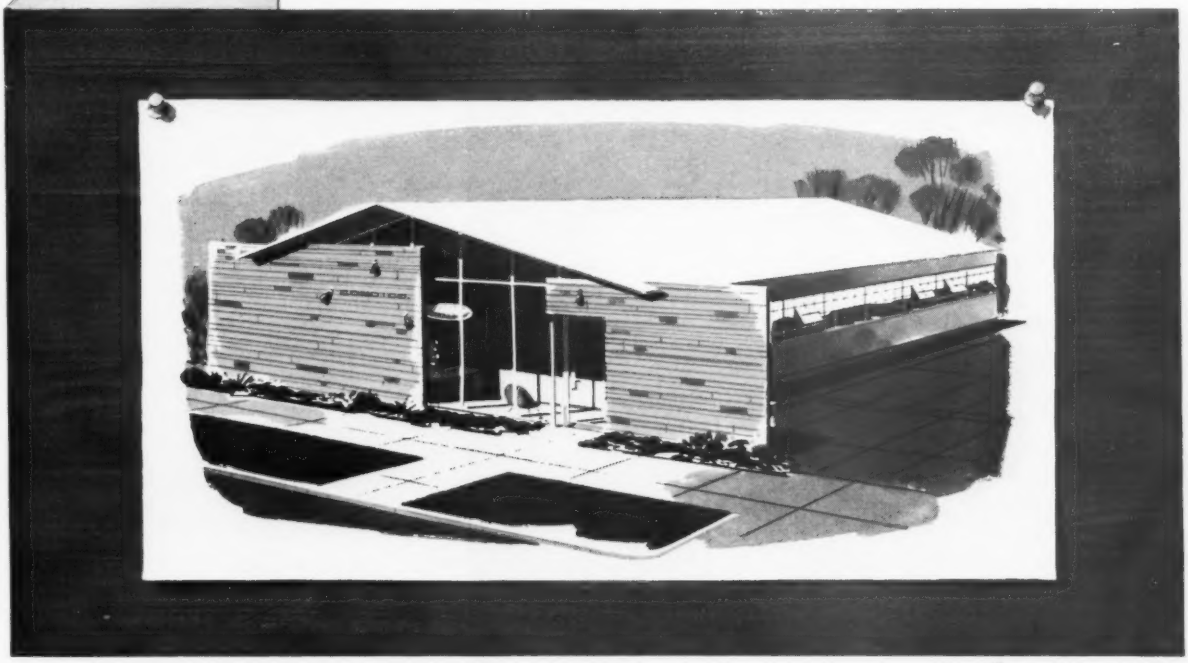
Spin-Lock screws are available with flat heads or hex heads, and are reusable. Send for bulletin.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY

. . . for more details, circle No. 14 on Reader Service Postcard

Soulé Buildings  adapt to...

ARCHITECTURAL STYLING AT HALF THE CUSTOM COST!



The basic Soulé Building unit features a rugged steel frame which lets you use less expensive, non-bearing decorative materials for side and end walls. Your contractor can use brick, wood, stucco or glass to achieve distinctive exteriors and interiors at big savings. Economy in construction materials, combined with the low initial cost of mass produced Soulé Buildings, lets you have an architect-styled plant, office or warehouse at amazingly low cost.

Soulé
LEADER IN STEEL BUILDINGS

4126

call or write for information

SOULÉ STEEL COMPANY

San Francisco 1750 Army Street, VAlencia 4-4141
Los Angeles 6200 Wilmington Avenue, LUdlow 5-0911
San Diego 1975 Fifth Avenue, BElmont 2-1071
Portland 2630 N.W. St. Helens Road, CApitol 3-5154
Seattle 4100 West Marginal Way, HOlly 3600
Spokane East 41 Gray Avenue, Riverside 7-8063
Phoenix 2026 South 11th Avenue, ALpine 3-3178
Salt Lake City 220 Greyhound Bldg., EMpire 3-7728

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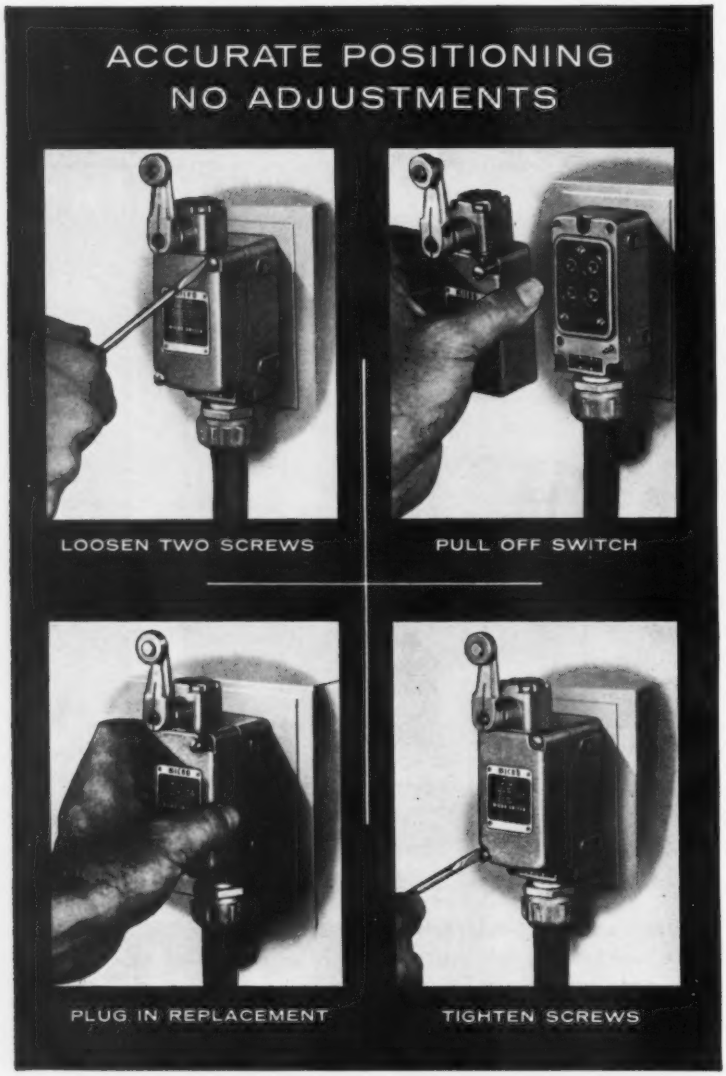
MICRO SWITCH Precision Switches

You can replace this precision switch in 20 seconds!

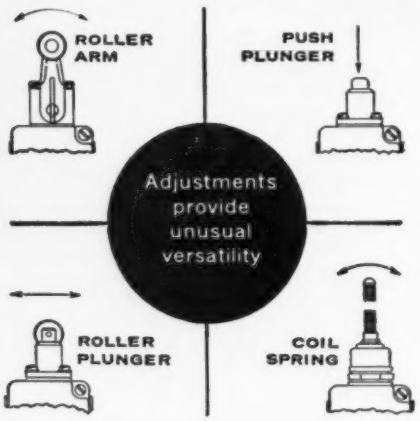


The new MICRO SWITCH "Plug-in Limit" saves many precious minutes of downtime on your high-speed automatic production lines. It plugs in like a radio tube—can be replaced in a fraction of the time required for ordinary limit switches.

This sensational new type "LS" switch offers all the features of rugged construction and precise, long-life operation as the industry-proved "1LS1" switch.

Wiring connections are made to a sealed terminal block enclosure which is permanently mounted to the machine. The switch enclosure, including all moving and mechanical parts, is plugged on to this block and precisely positioned by means of dowel pins.

Actuators available to meet all requirements



MICRO SWITCH "Plug-in Limit" switches are available at authorized distributors in key cities everywhere. Look in the Yellow Pages under "Switches, Electric." Send for Bulletin No. 20.

MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

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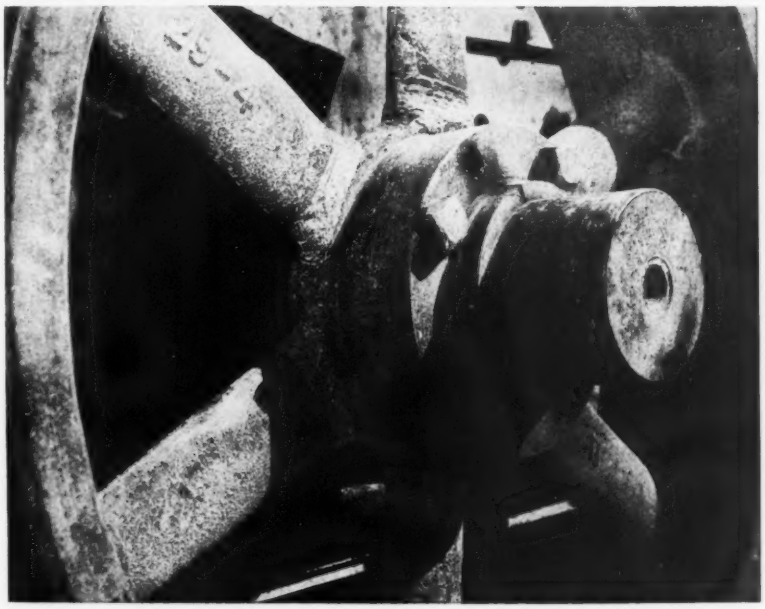
ORIGINAL
Low Temperature
EUTECTIC
WELDING ALLOYS

EUTECTIC Welding News

PUBLISHED BY EUTECTIC WELDING ALLOYS CORPORATION, 40-40 172 STREET, FLUSHING 58, NEW YORK, N. Y.

EUTECTIC WELDING HEADLINES • TIME-MONEY-MACHINERY SAVERS

WHEN THESE SPOKES CRACKED THIS ROCK CRUSHER STOPPED



(Cast iron pully wheel, completely disrupted production... repaired in under 24 hours with XYRON 2-24.)

Five of the six spokes on this cast iron pully wheel cracked at the hub, completely shutting down a Northwestern rock crusher installation. Manufacture, delivery and installation of a new pully wheel would take over 3 weeks, with a resultant loss in production.

Company engineers agreed that spokes could be repaired if welding temperatures could be kept low, and preheating eliminated. They realized most failures in welding cast iron are attributable to high heat input and result in cracking.

The local "Eutectic" Technical Representative was called in and recommended Veeing out the cracks with Eutec ChamferTrode, then repairing them with Xyron 2-24 (AC-DC)... a "Low Temperature Welding Alloy."

"Eutectic" is the inventor and sole maufacturer of "Low Temperature Welding Alloys."® Over 350 Technical Representatives from coast to coast are only a phone call away. They provide immediate consultation service and practical advice on any job—anywhere.

Eutec ChamferTrode (DC Straight) can chamfer or gouge out all metals without the use of oxygen. Its special exothermic coating concentrates the force of the arc right at the point of application. The arc blasts unwanted metal from its path, leaving an ideal surface for subsequent operations.

Xyron 2-24(AC-DC) is a patented cast iron electrode for "cold" arc welding, and is designed for repairing long cracks and defects. "Frigid Arc" coating allows greater ease of application at lower amperages.

The lower welding amperages possible with Xyron 2-24(AC-DC), and its ability to do the job without preheating avoids cracking and embrittlement and encountered often with conventional high heat welding materials. All of this permitted the quick, inexpensive complete repair of the pully wheel with such speed that only one shift was lost. When the pully wheel was restored to service, it operated perfectly...well within operational tolerances.

EUTECROD 1600 PRODUCES ROUND CLEAR NOTES

A world renowned manufacturer of brass wind instruments used this Eutectic "Low Temperature Welding Alloy"® to solve a long standing problem. How to reduce the percentage of rejects caused by joint failures, distortion, pinholes, discoloration and visible blemishes . . . all due to high welding temperatures.

A "Eutectic" Technical Representative recommended EutecRod 1600 be used to join component parts of clarinets, French horns, trumpets, trombones and saxophones. EutecRod 1600, a universal copper, brass and bronze alloy is an outstanding "brazing" type alloy; ideal for short, thin joints, far superior to conventional brazing alloys. Ultimate tensile strength: 55,000 psi. Since it does not require fusion of the surface of the base metal, EutecRod 1600 may be applied at very lowest temperatures.

The manufacturer now reports perfect color match and elimination of high heat warping, distortion and pinholing. Rejects have been drastically reduced, production costs cut.

Eutectic Warehouse—Service Centers
1108 Blake Street, Berkeley 2, Calif.
5348 Jillson Street, Los Angeles 22, Calif.
1414 South Street, Phoenix, Arizona

Eutectic Welding Alloys Corporation
40-40 172nd Street, Flushing 58, N.Y.

Please send me free the
NEW 1958 180 PAGE POCKET WELDING DATA BOOK
Complete guide to modern welding techniques

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EUTECTIC WAREHOUSE—SERVICE CENTERS • 1108 BLAKE STREET, BERKELEY 2, CALIF.
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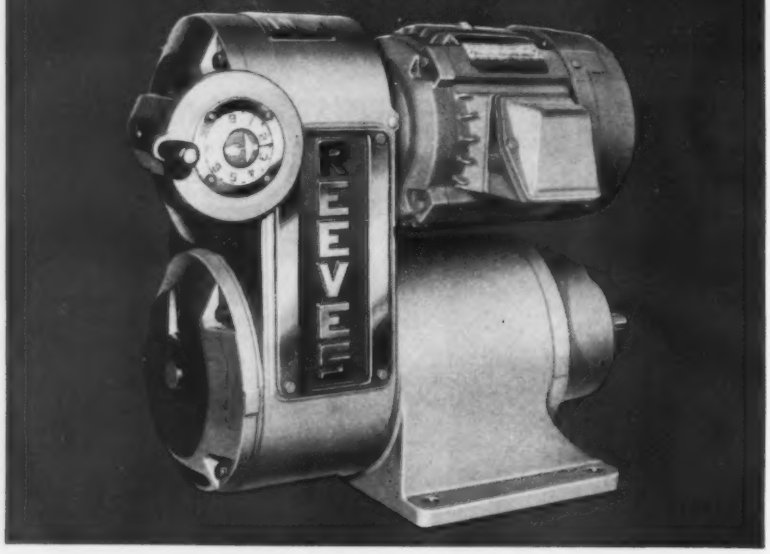
corrosion-proof variable speed



REEVES® *Vari-Speed MOTODRIVE*

© Put a halt to high replacement costs in corrosive atmosphere with this complete variable speed power package . . . by REEVES.

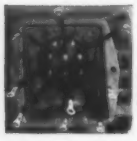
Available from ¼ through 5 hp., the 100, 200 and 300 size Motodrives are resistant to most acids, gasses and corrosive dusts. They feature a wide speed range . . . up to 10:1 with gear ratios from 1.17:1 to 195:1 . . . and provide infinitely variable speeds in hundreds of standard assemblies to fit nearly any space requirement.

Corrosion-Proof Disc Assemblies

Corrosion resistant cast iron; Exclusive REEVES "close grooving"—for positive disc lubrication.

Corrosion-Proof Gear Reducers

Cast iron gearbox and head; shaft oil seal—double tip neoprene; leak proof vent plug.



Corrosion-Proof Motor

Solid cast iron housing and fan—fully sealed cast iron conduit box—motor lead gasket seals off motor windings.

Fully sealed cast iron Motodrive case and inspection plates protect operating internals—lifetime stainless steel nameplates and identification plates—zinc plated Hexhead capscrews throughout. Write Dept. 34-M578.

REEVES DIVISION

RELIANCE ELECTRIC AND ENGINEERING CO.

1525 ADRIAN ROAD, BURLINGAME, CAL.

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WESTERN MEETINGS

continued from page 18

"PROFIT ENGINEERING" will be the theme of the Fourth Annual management conference sponsored by the Seattle chapter of the American Institute of Industrial Engineers (AIIE) to be held April 18 and 19 at the University of Washington in Seattle.

Nationally known speakers will present subjects of wide interest with emphasis on small business management. For information contact **C. W. Parrott,** Secretary, Seattle chapter of AIIE, 16245 S. E. 7th., Bellevue, Wash.

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AUTHORS WISHING TO SUBMIT PAPERS at the 1958 Western Electronic Show and Convention should submit 100 word abstracts and either completed texts or detailed summaries prior to May 1. All material should be mailed to **Dr. Robert C. Hansen,** at the Microwave Laboratory, Hughes Aircraft Co., Culver City, Calif.

The WESCON will be held during August in Los Angeles.

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March 17-21—NATIONAL ASSOCIATION OF CORROSION ENGINEERS, 14th annual conference, **San Francisco.** Contact A. B. Campbell, executive secretary, 1061 M & M Building, Houston 2, Texas.

March 27-29—ELECTRICAL MAINTENANCE CONFERENCE, combined show and conference, at the Shrine Exposition Hall, **Los Angeles.** Emphasis on automation and electronics. For further information contact Fred J. Tabery, 3443 So. Hill Street, Los Angeles.

April 11-12—PACIFIC NORTHWEST QUALITY CONTROL CONFERENCE, sponsored by the Seattle section of the American Society for Quality Control at Benjamin Franklin Hotel, **Seattle.** Conference will cover an introduction to Statistical Quality Control and Statistical Methods in the fields of foods, aircraft, heavy industries, and administrative applications. For further information contact D. F. Sundberg, Fisher Flouring Mills Co., 3235 16th Ave. S.W., Seattle.

April 12-17—AMERICAN CHEMICAL SOCIETY, California section will sponsor third Pacific Chemical Exposition in **San Francisco.** For further information contact Connolly & Leopold, exposition management, Hotel Sheraton-McAlpin, New York 1, N. Y.

APRIL 15, 16—NORTHWEST WOOD PRODUCTS CLINIC, thirteenth annual meeting, Davenport Hotel, **Spokane.** Joint meeting with Inland Empire Section of Forest Products Research Society.

APRIL 22-24—ELECTRONIC COMPONENTS CONFERENCE, Ambassador Hotel, **Los Angeles.** Theme of conference will be "Reliable Application of Component Parts." Contact Raymond Soward, chairman, at Convair.

April 26—NATIONAL MANAGEMENT ASSOCIATION, Pacific Northwest Area Council, meeting at Claremont Hotel, **Berkeley,** Calif. For further information contact NMA office, 321 West First St., Dayton 2, Ohio.

. . . for more details, adv. opp. pg., circle No. 19 on Reader Service Postcard ➡

New PAYLOADER® attachment

CUTS handling COSTS in HALF

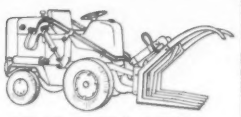
The Problem: Sonken-Galamba Corp., Kansas City, Kan., produces specification ingots using scrap aluminum that arrives via rail and truck. Unloading, stockpiling and feeding this tangled scrap to furnaces was slow, laborious and expensive. The company took their problem to the local Hough Distributor who recommended, demonstrated and sold a model HA "PAYLOADER" with hydraulic grab attachment.

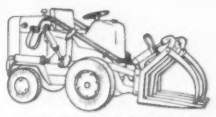
The results? Let Mr. Robert Ryan, Sonken-Galamba executive, tell it: *"Our unloading efficiency is now substantially greater. With the Hough machine, it takes 10 to 14 manhours to unload a trailer of aluminum clippings against the former 36 hours. The efficiency of loading the material to the furnaces is also increased. We are pleased with the increased output through the use of this unit."*

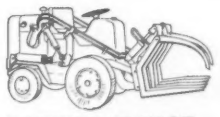
This model HA "PAYLOADER" tractor-shovel has a load-carrying capacity of 1,500 lbs. with the grab, and 2,000 lbs. with regular bucket. Other useful model HA attachments are fork lift, tine bucket, pick-up floor sweeper and castered dump hoppers. Operating features include exclusive one-lever bucket control, two speeds each direction, torque converter and rollback, break-out bucket action.

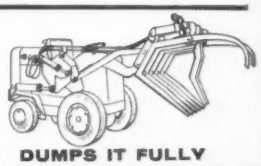
Your Hough Distributor wants to demonstrate what a model HA or larger "PAYLOADER" can do for *you.* Ask him about Hough Purchase and Lease Plans too.

A one-man handling system...


GETS A BIG LOAD


GRIPS IT FIRMLY


CARRIES IT FAST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THE FRANK G. HOUGH CO.
889 Sunnyside Ave., Libertyville, Ill.
Send "PAYLOADER" and scrap grab information:
☐ Model HA and HAH with grab (to 2,250 lbs. cap.)
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DANGEROUS SLIP

SAFE STEP

Eliminate high-cost accidents with low-cost A.W. Super-Diamond. A.W. Super-Diamond safety floor plate replaces DANGER with SAFETY wherever hazardous slipping conditions occur. Here's why!

- Raised steel, diamond-shaped figures give *maximum slip-skid resistance from all angles of approach.*
- Tough rolled steel construction lasts the life of the installation.
- Non-directional pattern—no matching problems—minimum waste.
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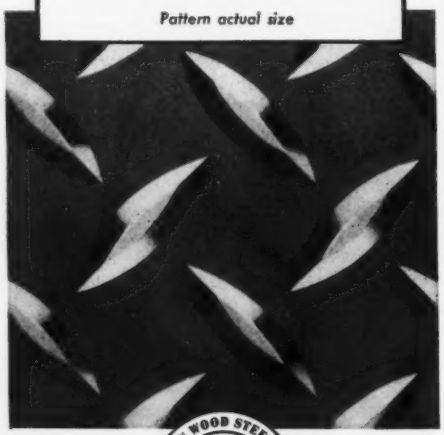
- Use as independent flooring or flooring overlay.

Get complete . . . free . . . information that may save you thousands! Write today on your company letterhead to Dept. SD-E12.

Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel floor plate.

Pattern actual size



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Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Hot and Cold Rolled Sheet and Strip—(Alloy and Special Grades)

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New Towmotor "Constant-Power" Lift Raises Productivity and Profits

It's easy to see how Towmotor fork lift trucks built a reputation for modern mass-handling efficiency.

As *standard equipment* you get engineering advances like the new Towmotor "no-power-loss" pump that guarantees instant response and constant lifting action. Towmotor operators get positive control in raising, lowering and positioning loads. Handling tons of materials is swift, safe and continuous!

With Towmotor fork lift trucks more work gets done with less fatigue. Motion-saving centralized control—cushioned-comfort seating—dual entry compartment—high free lift—are other standard features that give you convincing reasons for buying modern Towmotor-Gerlinger equipment.

For latest information on the industry's most complete line, send coupon below.

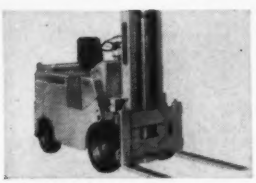
Leaders for 39 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR
THE ONE-MAN-GANG
-GERLINGER

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

Today's industries need Towmotor Continuous Operation

Towmotor Standard Accessories that grab, scoop, push-and-pull, ram, revolve and even shift sideways, offer versatility that saves manhours and dollars daily.



"Pace-Maker" Series Model 540 is typical of new fork lift trucks in the combined Towmotor-Gerlinger line. Load capacities from 1500 to 40,000 pounds.

Driving Ease More Than Tripled with new Towmotor power steering! TowmoTorque Drive adds cushioned "creep" control unequalled in the industry today.

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☐ *Send free Towmotor Catalog No. SP-23*

☐ *Send free Certified Job Studies relating to our business, which is*

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WHAT'S YOUR TIME WORTH?

Time is money, and you can save **plenty** with TOLEDO Pipe Tools. This DROP HEAD RATCHET THREADER, for example, the handiest tool you will ever own, gets plenty of daily use. When dies are to be changed, you're sure it's a better buy, for a simple pull on the pawl and the die slips out. It's typical of TOLEDO tools — every feature is designed to save time . . . and money . . . . for **you.**

Ideal for Close Corners—if you have room for a 30° swing, you can use a TOLEDO. Light, and easy to use, it saves time when you need it most.

Instant Die Change—dies can be changed in a few seconds—fit pipe or conduit from ⅛" to 2", and available in a range of three sizes.

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Rust-Resistant Finish—rifle barrel handle finish is practical and attractive. Ball end is more convenient and gives a better grip.

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News Notes from the West

Introducing Our New Southwest Editor

Martin P. "Marty" Semans, who takes over this month as our Southwest Editor. Formerly with a Los Angeles electronics firm, Marty has extensive Western industrial and editorial experience. He'll be talking to you folks in Southern California, Arizona and Nevada. So watch for your news and stories appearing in each issue of WESTERN INDUSTRY.

•

A SHORTAGE IN THE TILL of your welfare and pension plan fund may be due to lack of "know-how" on the part of managers—not because of dishonesty.

So says **Julius S. Wikler,** first deputy superintendent of insurance, State of New York, in speaking before the National Conference on Employee Benefit Plan Legislation, held recently in San Francisco.

"A threat to the security of employee-members exists not only in the depredations of crooked administrators and trustees—which, in spite of recent publicity, involve only a small segment of welfare funds—but in the lack of knowledge as to proper handling and safeguarding of funds," Wikler continued.

"A welfare fund is a trust fund held for the benefit of its employee-members. There is no valid excuse for speculating with moneys intended for health and pension funds. Establishment of sound investment standards is imperative."

•

THE UPS AND DOWNS of California labor were listed recently by the State Department of Labor.

According to latest figures: Ups were reported in membership in labor unions (3%). In areas, union membership was up one percent in Los Angeles; two percent in San Francisco Bay Area; and eight percent in the San Diego area.

California experienced new lows in manufacturing employment and new high in unemployment claims.

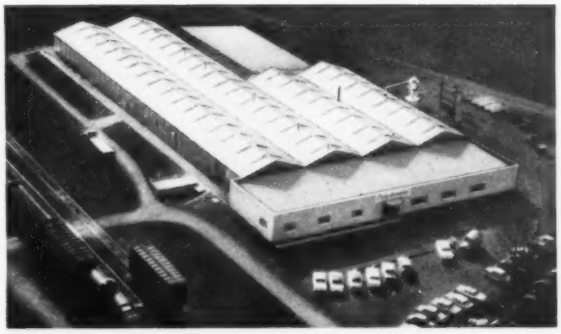
A cheerful low was that in work stoppages (strikes). A total of only 96,000 workers were involved in work stoppages in 1957 . . . a very small segment of the 4,500,000 workers in the State.

THE LADIES GET TOGETHER—These ladies are wives of members of the Great Salt Lake chapter of the AIIE. They have formed a Women's Auxiliary that meets each month for dinner meetings. Speakers and dinner topics include subjects of interest to women, as well as those dealing with industrial engineering. **Mrs. C. P. Gravis,** Bountiful, Utah, is chairman; **Mrs. E. R. Allcott,** Salt Lake City, assistant chairman; **Mrs. G. E. Molascon,** American Fork, assistant chairman; **Mrs. Rhoda Vaughn,** Ogden, assistant chairman; **Mrs. C. P. Mott,** secretary-treasurer.

Precision-made parts are assembled on site. Even large buildings go up fast—"move in" time is reduced.

Rigid frame design permits floor-to-ceiling, wall-to-wall use of space. Buildings can be completely insulated.

Why Armco Steel Buildings give you more value for your money



Buildings can easily be enlarged or modified by adding standard units.

Note that the overhead crane has free access to all sections of the building.

Armco Steel Buildings give you more solid value for your building dollar. The reasons: Basic Armco plans save preliminary design and engineering costs. Factory-engineered parts are delivered to your site ready for rapid assembly. Standard panels lock together quickly, then are bolted top and bottom. This modern technique saves many costly steps of conventional construction.

The saving goes into the quality of the building, too.

In an Armco Steel Building you get a weathertight structure that withstands greater wind and snow-loading. The aluminum-coated or zinc-coated steel panels assure *extra* durability. Maintenance costs are greatly reduced, too.

Attractive, long-lasting steel buildings are available in more than 5000 sizes, from 28 sq. ft. to more than 100,000 sq. ft. with clear spans up to 100 ft. Interiors can be finished just like any other building.

Before you make a decision on your building needs, be sure to get the full story on Armco Steel Buildings.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
CALCO AND NORTH PACIFIC DIVISIONS
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Send information on Armco Steel Buildings for the following uses:

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*Approximate size*_____

*Name*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

ARMCO STEEL BUILDINGS

ARMCO®

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P&H Electronic "Stepless" Control

can revolutionize your crane operation!

Today, there is a remarkable new control that can help you lower the cost of handling materials through the air. It's P&H Electronic "Stepless" Crane Control — the greatest advance in overhead crane design in over a decade.

This exclusive P&H development provides instant response enabling operators to move tremendous loads quickly and safely with fingertip ease and pinpoint accuracy. P&H Electronic Control has a simple wiring circuit that eliminates most of the heavy-wear parts found on other crane controls. The results: exceptionally low maintenance, fast servicing, less down-time, and drastically reduced parts inventory.

All electrical and mechanical parts for P&H overhead cranes are designed, built, and assembled by P&H. This integration of manufacturing activities reflects P&H's philosophy of single source responsibility. For more information about Electronic Crane Control write Dept. 103W, Harnischfeger Corp., Milwaukee 46, Wisconsin.

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P&H ... quality and service for 74 years

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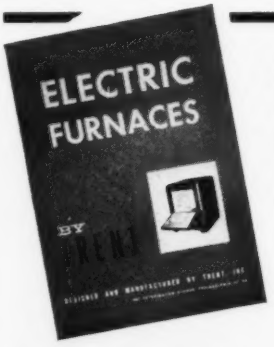
Wherever CONTROLLED RADIANT HEAT is Essential

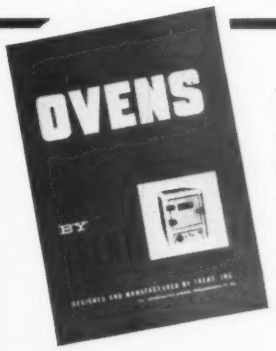
TRENT Electrically Heated EQUIPMENT and "Folded-and-Formed" HEATING UNITS

Trent exposed ribbon type resistor heating elements have proven their advantages wherever high-temperature, controlled radiant heat is essential for efficient, low cost process operations of every type. The Trent "Folded-and-Formed" heating element is the heart of Trent Custom-Built Equipment and Heating Units . . . to assure a greater radiating surface per square inch of cross-section than any other type of electrical heating element!



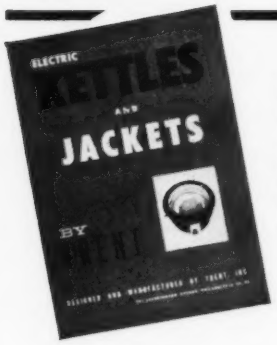
Annealing and Tempering Furnaces
Conveyor Furnaces
Air Draw Applications
Pot and Trough Type
Muffle Type Furnaces for the Lab

Positive Heat Control for Required Temperatures up to 2300° F. Write for Bulletin 75-TC for details on design and construction features.



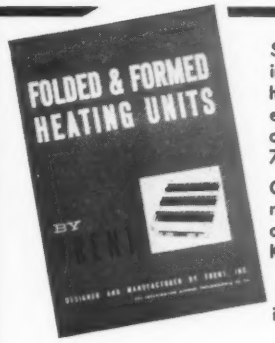
Constant Temperature Ovens
Gravity or Forced Convection
Vertical and Horizontal Air Circulation
Special Laboratory Ovens

Longer life and faster control response for every application. Write for Bulletin 71-TF for detailed data.



Only Trent "High-Temperature" Kettles and Jackets provide Positive Temperature Control up to 2000° F. No Pressure Equipment • No Over-Heat • Heat Zone Control • All-Welded Internal Connections for Maximum Life.

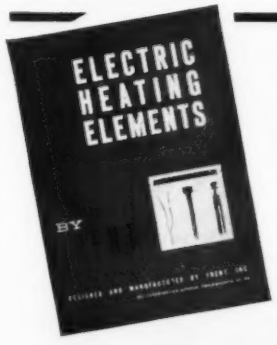
Write for Bulletin 72-TE for details on the complete line of available types and custom-designed installations.



Standard Racks, 12″ x 12″, for installation vertically or horizontally, side-by-side, end-to-end, or in banks to provide controlled temperatures from 750° F. to 1700° F.

Custom Built Racks, available in a range of sizes to fit any flat or curved area . . . provide maximum KW at temperatures to 1850° F.

The proven heat source, readily installed in your existing equipment. Write for Bulletin 101T for detailed data on wide applications.



Strip and Cartridge Heaters
Oil and Water Immersion Heaters
Trent "Packaged" Circulation Heaters

A range of types and sizes to meet every wattage requirement and voltage condition. Write for Bulletin 74-TD.

TRENT ENGINEERING SERVICE

Trent industrial heating engineers are prepared to study your heating requirements and recommend the Trent installation to solve your heating problems. Engineering services are available through Trent representatives located in principal industrial centers in United States and Canada.

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Electrically Heated Industrial Equipment

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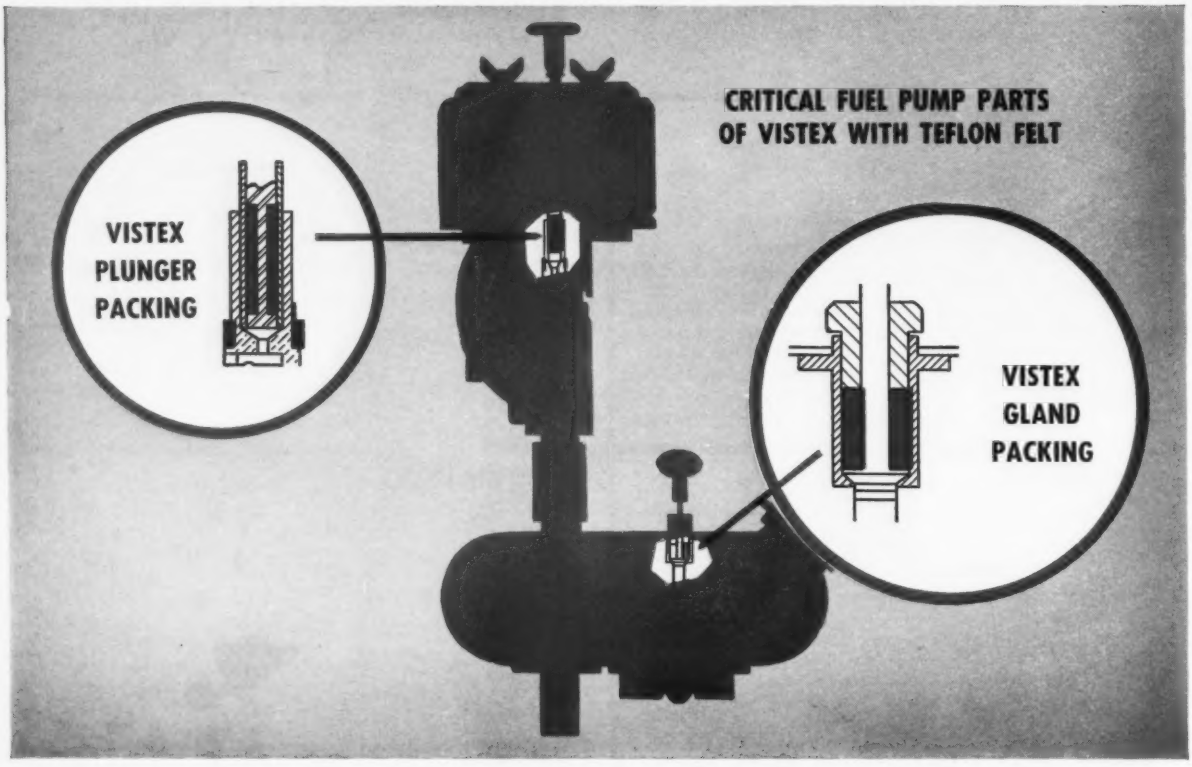
VISTEX WITH TEFLON FELTS

for positive . . . self-lubricating seals



Are dependable seals your problem?

Here's a *new* way to solve even the toughest ones . . . *American's Versatile Vistex-with-Teflon Felts!*

Felted of Teflon reinforced synthetic fibres, these advanced-type, self-lubricating Felts are setting new performance standards under both high and low temperature operating conditions. They resist *all* acids, alkalis, aliphatic and aromatic compounds . . . maintaining their thermal stability in applications up to 420°F!

You get better, stronger seals . . . Vistex-with-Teflon Felts withstand up to 5,000 psi . . . eliminating troublesome lateral plastic flow and sealing on polished or irregular surfaces with only minimum pressure.

Vistex-with-Teflon Felts can be precision cut without ravelling or fraying . . . having a *very* high tear value. Due to their great strength they are reusable for *even* greater economy.

Available in 36" x 36" sheets with thicknesses of 1/16", 1/32", 1/64" or as cut gaskets, strips and washers . . . quality Vistex-with-Teflon Felts can economically and efficiently meet your specific requirements.

Save time—consult our engineering staff for assistance in choosing the correct Felt. Remember: It's the largest, *most* experienced staff in the industry . . . and it's backed up with the largest, *most* modern laboratory facilities in the industry.

Write today for technical Bulletin VT-2-856 . . . on your company letterhead, please.

OTHER VISTEX FELTS BY AMERICAN

In addition to Teflon, Vistex Felts are also impregnated with such polymeric compounds as:

HYCAR • NEOPRENE • BUNA S
NATURAL RUBBER • RED NEOPRENE

. . . to meet individual chemical and physical conditions.

REPRESENTED BY: A. B. BOYD CO.

OFFICES IN— San Francisco, Los Angeles, Portland, Seattle

American Felt Company
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Other data sheets and technical bulletins covering specific Felts are available on request from any A. B. Boyd Office or by writing—on company letterhead, *please*—to American Felt Company, General Offices and Research and Engineering Laboratories, 315 Glenville Road, Glenville, Conn.

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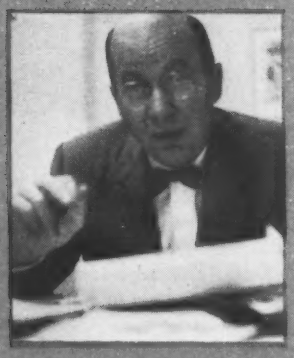
A Special Western Industry Interview

"Let's clear the air . . . and stop SMOG . . . before it's too late . . . . . "



Benjamin Linsky*

Q. Mr. Linsky, many Western plants and industries outside of Los Angeles have expressed concern over air pollution and how it will affect them. Do you think they are justified in being concerned?

A. Yes, I think all Western plants are justified in being concerned with the effects of air pollution on their operations. The Western area has the type of area-wide eye-irritating, haze-producing air pollution. While this does not relate to the chemically corrosive type of property damage from localized air pollution effects that Los Angeles has cleaned up, the significance lies in the potential *crash* program that may have to be initiated by industry to comply with regulations adopted to combat this area-wide air pollution.

The traditionally "well-mannered" industries like electronics and precision machinery are concerned as possible victims of air pollution. Also, one of the least publicized aspects of the air pollution problem is the growing number of *spitting-distance* property damage suits. The general public is fast realizing that courts are sympathetic to claims for property damage resulting from air pollution emissions.

Q. How can a plant manager or plant engineer find out whether he should take steps to control his present or potential air pollution problem?

A. The plant manager or plant engineer can get answers to two different questions in different ways. The first question is whether he is apt to be faced with an area-wide air pollution problem in which his air pollutants may have to be controlled, even though they aren't causing any local problem.

He can learn this best by checking with the local meteorologist, local health officer or the local air pollution control officer in his city or county. He will get information about the terrain and the frequency with which the winds die in his area. If he finds he is in a basin situation or is in an area where winds die and the sun shines bright frequently, then he has to look seriously at area-wide air pollution potentials and controls that may affect him. He can also find out quickly whether he is contributing to some localized air pollution problems by doing a roof top survey and a neighborhood survey, and by checking with his public liability claims agent. The insurance company claims agent can tell him whether or not there have been any claims paid for damage to automobile paint finish of parked cars due to reactive materials . . . such as chromic acid mist, sulphuric acid mist, sodium carbonate from cyanide heat treat baths or cast iron dust from cast iron grinding operations. The roof top survey can point out whether there are build ups of dust or droplet deposits that can carry over into neighboring property. It is also possible to find early damage to the plant's own roofing before it starts leaking and an expensive repair job would be required. At any point in this survey an early indication can result in more extensive engineering determination of exactly *what* and *how much* and *how often.*

The complaint records of the company will also show whether there have been complaints from smoke or dust fall out, or fly ash fall out from open burning or poor incineration in the backyard of the industry.

Q. Could you explain the difference between certain pollutants?

A. Well, they fall in several categories. The physical types are the large dust, the microscopic dusts, the drop-

***BENJAMIN LINSKY** is a mechanical engineer and the air pollution control officer of the San Francisco Bay Area Air Pollution District. For more than eight years he was with the City of Detroit heading their program of air pollution control. Prior to that, he guided the efforts of the automobile and other major industries in industrial safety engineering in Detroit and southern Michigan. He is the immediate past president of the Air Pollution Control Association and a member of the Federal National Advisory Committee on Community Air Pollution to the Surgeon General of the Public Health Service. The Bay Area Air Pollution Control District is the first multi-county air pollution control agency in the United States. It covers the six counties surrounding the Bay. It has been operating at an increasing pace and is now in the process of collecting information on which to develop regulations to control industrial processes and incineration emissions.

"Once you have learned you have an air pollution emission problem, you can do a good deal of analytical work in finding out how to correct it yourself . . . There are several good handbooks describing the various kinds of air pollution control equipment and procedures . . ."

lets, the microscopic droplets, and the gases. Each takes a different kind of treatment, each has a different range of effects. The large dust and the large droplets obviously don't contribute to an area-wide problem because they fall out and cause only local problems. The other three can cause either local problems because of the down wash of the plume or other area-wide problems. Chemically, the pollutants can be just about any type. The chemical types hardest to understand for most engineers are types completely innocuous and inoffensive at the point where they are released to the atmosphere, but become air pollution problems some time after they are in the air. An obvious example is vaporized grease such as one gets from melting dirty scrap iron. The vaporized grease condenses in the atmosphere and coats houses and cars and windows hundreds of feet away with a film of greasy oil. Less obvious types are some of the hydrocarbons such as we find in gasoline or in solvents that actually become "sunburned" —the lay phrase for photo chemical oxidation causing eye irritating and vegetation damaging new gases and microscopic droplets, which also add to the haze. Very rarely you run into something as damaging as hydrofluoric acid mist that will etch glass windows. But cast iron grindings landing on an automobile covered with dew will oxidize to iron oxide, and take some oxygen right out of the organic material in the paint, so you get a pit in the paint and a brownish reddish bump.

Q. What can plant engineers do about their pollution problems?

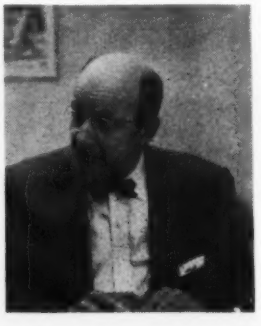
A. Once you have learned you have an air pollution emission problem, you can do a good deal of analytical work in finding out how to correct it yourself. If the troublesome pollutants are microscopic dusts, microscopic droplets or gases, the cyclone separators or the settling chambers are not going to be effective answers, because they are workable only on the larger dusts and the larger droplets. There are several good articles and a recent air pollution handbook describing the various kinds of air pollution control equipment and procedures.† Many of them have been given new names as "air pollution and control equipment," but are familiar as pieces of equipment used in various process industries. For example, the electrostatic precipitator in one form is very well-known as an intake air cleaner where the air in precision machine shops or in electronics operations has to be cleaned. Similarly, filters are well recognized in many process operations as well as in intake air cleaning, although the size and type may be different for exhaust air cleaning because of corrosiveness or temperature of exhaust gases. The use of fume burners or activated charcoal adsorbers are well recognized as ways to take care of combustible gases having offensive or dangerous aspects. Although it's recognized that in air pollution exhaust problems, the concentrations are generally much lower than in process gas streams. Even the baghouse or the cloth filter collector is well recognized in its crudest form—the vacuum cleaner. But, again, the concentrations of dust are very much lower in exhaust air cleaning, and the volume of air or gases handled is generally greatly increased into the tens of thousands or hundred of thousands cu. ft. per min. The cyclone type centrifugal separators or the scrubbers, whether they use water or some chemical, are also well recognized as pieces of processing equipment, although again, the low concentrations in large gas volumes may be strange when you first look at them from an air pollution control viewpoint. Further, just as in process operations—and particularly the chemical and metallurgical processes—you'll realize it is only occasionally that you can rely on one specific type of equipment to solve air cleaning problems. More frequently you'll find you need two or three types of control equipment in series to do the necessary job. If you have a dusty, corrosive, hot gas being exhausted, you may wind up with an after burner, a chemical scrubber, a cooler, an electrostatic precipitator and a cloth filter collector.

Q. I suppose cost of control is always the big question?

A. The answer may run from a tenth of a few cents of capital investment per cu. ft. per min. up to $2.00 per cu. ft. per min., capital investment. In terms of per cent of plant investment, capital expenditures may run from one-tenth or 100th of 1% up to as high as 5, 10 or 20%, depending on the nature of operations needing control. A recent figure for cement plant indicates that 6% of plant investment will do an excellent clean up job of an uncontrolled cement mill. As to net costs of the installation and operation of equipment, this will vary from a very healthy profit to a decided expenditure. It's not uncommon for air pollution control equipment to make money in a prudent investment pattern. This is particularly true when some operation has not been critically examined by management for 10, 20 or 30 years; because almost any present day operation that hasn't been looked at critically for 20 years can be done better with modernized equipment. In addition to direct traceable profits from doing something better, benefits in cash may be traced only with difficulty. But this can be the return and dividends from a public liability insurance policy loss reserve, out of which payments have stopped for damaged car finishes. In this connection, one manufacturer of air pollution control equipment said business doubled when auto manufacturers came out with two-tone car finishes, because manufacturers and other plant operators had to clean up their operations to avoid damage to cars parked nearby.

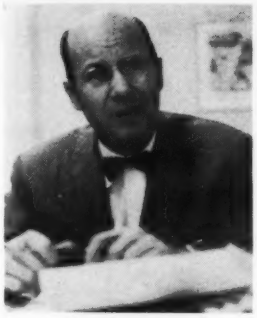
Q. How about intangible benefits?

A. Yes, there are intangible benefits, but they are hard



"It's not uncommon for air pollution control equipment to make money in a prudent investment pattern. This is particularly true when some operation has not been critically examined by management for some time, because most operations can be improved by modernization . . ."

† AIR POLLUTION HANDBOOK, edited by Paul L. Magill, Francis R. Holden, Charles Ackley. Also, Los Angeles Air Pollution Control District "*Smog Brief*" No. 7 lists air pollution control devices.



". . . in the case of some acid emissions, five recognizable droplets per hour that can reach property owned by anybody is probably the maximum allowable. Other emissions depend on the neighbor nuisance or damage effects, and the tightness of present and future regulations. . ."

to nail down on cost sheets. These may range from being able to hire better employees without paying premium wages because the plant is now clean, on through to intangible benefits of better community relations in the nearby town or area. One petroleum refinery gave as an example that they had spent $5,000,000 in air pollution control equipment. The company management felt they had about broken even or a little better on the entire operation because of improved process control. They also had the definite feeling of improved community relations to which they could not assess a dollar value. In the installation of a rundown or blowdown tank at the refinery which had as its immediate incentive the control of occasional odorous gases displaced when hot liquids ran into the rundown tank, management felt by putting a flare on top of the vent they would be alerted whenever a spill occurred.

Q. Can some operations actually make money with air pollution control equipment?

A. There are classic examples where industrial operations have made money from air pollution control installations. The collection of lead in secondary lead smelting by cloth filtered collectors is a classic example. It has become an inexact axiom that the "catch in the baghouse at a secondary lead smelter represents the profits." Waste that formerly was carried away by the wind and is now being collected in a pile and dumped serves as a real incentive to management to find uses for the waste materials. The conversion of sulphur gases, especially hydrogen sulphite, to elemental sulphur, is now a classic in the field of petroleum refining. Solvent recovery has been in use at some of the lithographing plants for several years as an economic means of recovering expensive solvents. Now with air pollution control as an additional incentive, solvent recovery or utilization by activated charcoal adsorption or by incinerating for drying or baking has made solvent recovery in control profitable. This also points out that equipment and methods used in air pollution control are similar in type to equipment and methods used in various process industries for many, many years—but with new applications and new concentrations or dilutions requiring extensive re-engineering from original concepts. Although one of the earliest uses of electrostatic precipitators was for cleaning damaging solids from smelter gases, the electrostatic precipitator then became extensively used in cleaning process gases, such as blast furnace gas. In the past several years, first in the pulverized coal industry and now in the metallurgical trades, electrostatic precipitators are being used again for high degree exhaust air cleaning.

Q. How clean should an operation be? What maximum emissions should be allowed?

A. I am reminded of the question asked me by the plant engineer for one of the larger manufacturing companies. He said, "Ben, in specifying control equipment for a chrome plating operation, what maximum allowable emission should I set for chromic acid mist coming out of the stack?" I scratched my head on that one and then came out with this answer. "*Five recognizable droplets per hour that can reach property owned by anybody is probably the maximum allowed.*" The reasoning is obvious: if you have a light or strong wind blowing in a single direction without much wavering, and you have five recognizable droplets per hour of chromic acid mist, a car within range is going to get saturated when parked for eight hours straight. Someone is going to have to pay for damage, because chromic acid mist will put a blush on the black or dark finishes and will mar and stain light finishes. Answers to other emissions, and how clean should they be, are not as easily come by. First, of course, would be any legal requirements written into air pollution or zoning laws; second, would be an intelligent projection of how much tighter those regulations or laws might become during the useful life of the equipment. A third consideration would be the non-legalistic, but practical neighbor nuisance or damage effects visualized on the basis of observations and judgment.

Q. What if air pollution poses no immediate problem? What can a plant manager do to prepare for regulations?

A. I think the best answer is to start investigating and planning now, and do it as early as possible; even start building up reserve accounts to cover cost of equipment. This can be justified to any fiscal management including your company board of directors, because after a regulation has been established or after the authorities have knocked on your door, you'll find it far more expensive to go into a crash program than if it is planned ahead. You may even find that because of delays in delivery and completion of engineering, you'll select a method less effective than if you had the time to do it. For those not faced with problems immediately, you obviously have some time to do some forward rational planning. Besides, you never know when the president or the chairman of the board of directors is going to ask you about your air pollution potential, costs, etc. . . . and it's comforting to have the answers in your back pocket or files. For those planning new operations and new installations, it can't be considered preaching to urge you to design appropriate air pollution control devices, methods and procedures so you can project the total costs. It is not uncommon for management to learn that had they taken into consideration air pollution control costs at the time they were considering alternate methods of new operation, they would have selected differently. Such errors can be avoided by planning, engineering and calculating now—instead of sometime later.

Q. Can a small plant take care of its own problems

. . . *Continued on Page 70*

". . . after a regulation has been established or after the authorities have knocked on your door, you'll find it far more expensive to go into a crash program than if it is planned ahead. Errors can be avoided by planning, engineering and calculating now—instead of sometime later . . ."

FOUR-FT· TRENCH permits conveyor to drop so fixtures can be hung on hangers which are normally eight ft. above floor level. This eliminates conveyor loading platform.

Automatic handling = automation + integration

Overhead conveyor system threading through this plant ties it together . . . and boosts output.

HERE'S HOW an automatic handling system led the way to automation and integration in a Western plant.

Sunbeam Lighting Co. of Los Angeles put in this system when it renovated its lighting fixture finishing department. Now the department can finish in one shift the entire output of fixtures produced by its shop in two shifts.

And the automatic handling system bridges the gap between shop production and final assembly, eliminating lost motion and unnecessary handling.

The fixtures are not handled again from the time they are loaded onto the finishing department conveyor until they are unloaded in the final assembly department. Cleaning, surface treating, drying, electrostatic painting and final baking are also fully automatic.

Only manual effort required anywhere along the finishing line is in the touch-up booth immediately following the electrostatic booth. Here are two employees using spray guns to touch up the work as it flows steadily past.

Key installation for automatic handling is an 810-ft.-long overhead conveyor equipped with roller-type hangers at 6-in. intervals. The system was engineered and installed by the Jervis B. Webb Co. Conveyor speed is controlled at 6 ft. per min.; approximately 2 hours and 15 minutes are required for one complete conveyor circuit. But the capacity of this conveyor, based on the 1,620 hangers spaced at 6-in. intervals along its 810-ft. length is no reliable indication of finishing line capacity. Some of the larger fixtures may span several hangers in hanging; other smaller parts may be hung several deep (linked together by hooks) on each hanger.

The engineering skill employed in designing the renovated finishing department is indicated by the fact that no shutdown caused by mechanical failure has caused more than an hour of lost time. Many of the details engineered into this line which assure its consistent, trouble-free operation will be interesting to others who contemplate similar renovations.

New components along the line include a 50-ft. long gas-fired cleaning and surface treating unit (Bonderizing unit); a 38-ft. gas-fired drying oven operated at 400 deg. F.; a Ransberg No. 2 electrostatic spray painting unit; a water-wash touch up booth (Binks); and a final 40-ft. gas-fired baking oven operated at 300 deg. F., through which the fixtures make four looped passes before emerging ready for the final assembly department.

One such detail contributing effectively to ease of handling is the 4-ft.-deep loading pit which parallels the overhead conveyor for approximately 50 ft. at the station where the parts or fixtures are conveyorized. Normally, the conveyor hangers are about 8 ft. above floor level. While it would

be possible to load a long part on the hanger from floor level, it would be impossible to do so when several smaller parts are linked together by hooks thus forming a flexible chain of parts.

To avoid any loading difficulty, the conveyor dips to a 4-ft. level just above the 4-ft. deep loading pit. Thus by dropping one end of a long part, or a chain of parts, into the pit the other end can be hooked onto a hanger without difficulty. The conveyor rises again just before it reaches the end of the pit, raising the parts so that they are suspended above normal floor level. This arrangement has proved far more effective than a loading platform onto which the fixtures would have to be handled before they were conveyorized.

The first stage of the automatic metal cleaning and treating unit contains the cleaning and surface treating solution (Bonderizing solution) operated at 160 deg. F. The second stage is a hot water rinse, while the third stage is a hot water plus chromic acid rinse. To save floor space, the 38-ft. drying oven is located alongside the cleaning unit. A sharp horseshoe bend in the conveyor just beyond the cleaning unit carries the fixtures back through the drying oven. Then another horseshoe bend in the conveyor carries the fixtures back across a work aisle and directly to the Ransberg No. 2 electrostatic sprav painting unit. This conveyor configuration made it possible to locate the various processing units in a manner to utilize available floor space with utmost effectiveness.

Due to the various shapes and sizes of the lighting fixtures, and especially to the sharp bends and recesses caused by multiple shop forming operations, the thickness of the coating applied in the electrostatic booth must be closely controlled to avoid paint runs and sags yet obtain maximum coverage. To facilitate obtainment of optimum coating thickness on each fixture, the control panel for the electrostatic unit is located so that the operator can look directly into the booth while he is making adjustments.

The changeover to greater or lesser coating thickness may be made at just the right instant without danger of over- or under-coating a few parts. While this seems like a simple arrangement, it is a great aid in handling the fixtures through the finishing department in a manner to keep rejects at a minimum.

Conveyorized fixtures move directly from the electrostatic booth into a water-wash paint booth where two employees accomplish all touch-up work as the fixtures flow past. Beyond the touch-up booth, the conveyor moves through a wall opening directly into the baking department. Here, again, floor space has been conserved by erecting a relatively square-shaped baking oven through which the fixtures make four looped passes. Time in the baking oven is 20 min. Baking temperature is 300 deg. F.

Another innovation in material handling comes after the conveyorized fixtures leave the baking oven. From the oven, the conveyor moves directly into and entirely across one end of the final assembly department. This particular end of the final assembly department is used for bay storage of fixture components awaiting assembly. As the conveyor moves past these bays, conveyed fixture parts are removed from the conveyor just when they reach the bay in which they will be stored. A second handling is avoided.

Lubricating system aids handling

Any automatic material handling system must have auxiliary systems which keep it working smoothly and efficiently. One such system in use at Sunbeam Lighting Co. is an Alemite automatic conveyor chain lubricator. This system not only lubricates the conveyor chain itself as it passes, but is equipped with two offset spray nozzles which lubricate each hanger roller as it passes. An automatic timer is used to shut the lubricating system off after a given interval.

Lubrication can be applied to the conveyor during one complete conveyor circuit, then the system shuts off until additional lubrication is required. This prevents over lubrication and the danger of excess oil which might run down and contaminate the painted parts.

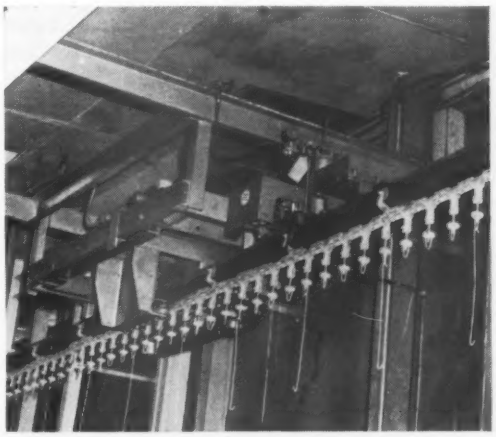
It's a well-known fact that the hooks used to hang parts on a finishing line conveyor soon become painted themselves and require stripping. In most cases the hooks must be stripped after each use. To avoid this, Sunbeam engineers designed double-ended hooks which can be used once in one position, then inverted and used again before stripping is required. Here again a simple arrangement, but it cuts stripping time in half.

A nearby, fire-proof vault is used for storage of the paint used in the automatic electrostatic booth. Here again automation prevails. Thinner for the paint is metered in automatically from a 6,000-gal. and 2,000-gal. underground storage tank.

As might be expected, there are a few special fixtures that just won't fit on the automatic line. These are hand-sprayed in a 35-ft. water-wash paint booth adjacent to the paint storage vault. This booth also has its own adjacent drying oven so it does not interfere in any way with the automated conveyor handling line.

Sunbeam Lighting Co. officials point out that the finishing of lighting fixtures is a very critical operation because such fixtures are usually installed where they are totally visible and even the slightest defect would be noticeable. Therefore very rigid inspection is employed. The fixtures are line-inspected on the conveyor both before and after automatic cleaning and surface treating, and again after painting. Rejections due to finishing operation run less than ½ of 1%.

This figure alone points out that consistent good quality finishing can be obtained in conjunction with automatic handling from the time the fixtures are conveyorized, until they are unloaded in the final assembly department and are "ready to go."



AUTOMATIC LUBRICATOR (Alemite) for conveyor chain. An automatic timer controls length of time lubricator operates. The two offset spray nozzles extending left from lubricator lubricate hanger rollers. Double-ended hanging hooks are also visible. Hooks are used once, then inverted and used again, thus chopping stripping operations in half

REDWOOD —

A UNIQUE WESTERN product—Redwood—is on the upswing as a versatile industrial material.

Redwood has a number of virtues which make it an ideal choice for many diverse factory applications. And new uses are being uncovered every day.

Redwood is lightweight, relatively low in cost, withstands chemicals, and does not impart color or odor to a product.

Since pioneer days, redwood vats and tanks have served distillers, wine-makers, and tanners, and it has almost traditional use in the mining industry to handle acids. For tanks, redwood has an advantage hard to beat: Redwood tanks need little or no maintenance. Further, they are easily dismantled, moved and re-erected.

These are familiar properties. Now modern industry has found new applications for this Western wood. It has gained prominence for cooling towers, bins, scrubbers, pipe, filter presses, in pattern making, and even for spindles and bearings in some textile plants.

Because redwood is a natural product, technical data on special properties isn't as abundant as for metal, glass and plastics. But a startling number of new application trends have come to the fore as engineers discover redwood's many attributes.

Fluor Corporation, Los Angeles, for example, recently designed a trickling filter with redwood packing for bacterial treatment of refinery effluent. A redwood degasifier removes entrained gases from reactor cooling water at the Atomic Energy Commission's National Reactor Testing Station. Redwood is specified almost exclusively in the great oil fields to store oils containing corrosive amounts of hydrogen sulphide. Hydrogen sulphide and related sulphur compounds are detrimental to concrete and steel, but have not been found to affect this extremely durable wood. A sanitary district sewage disposal plant uses 33 drum type filters, all with redwood grids. Redwood also plays an important part in settling tanks, sludge collectors, and biofiltration systems for this sanitation district.

Chemical resistance pays off

Redwood's resistance to chemicals is attested by a number of cases. For instance, a battery of redwood vats, unlined, was found to be in excellent condition after 37 years of handling sulphuric acid as hot as 140 deg. Another case is at the historic A. K. Salz tannery in California, venerated tanner of California Saddle Leather, which has many of the same redwood vats in use holding solutions of lime and sodium sulfide that were built with the tannery in 1861. They show no deterioration. This same tannery uses hollow redwood logs to carry tan liquors from leaching tanks. These logs pipes, many older than the tannery, are as sound as if they were just fabricated.

Redwood's superb insulating qualities make it adaptable for high voltage electrical transmission lines. In experiments at Stanford's Ryan High Voltage Laboratory where line losses at 400,000 volts are studied, redwood pole insulators separate the two huge grids and confine electrical loss to a water-filled glass tube. In such line loss studies, redwood replaced urea-resin and glass insulators which were found far less efficient.

Because redwood is easy to fabri-

Yes, you'll be surprised at all the ways this unique Western product can be used in your plant. For instance, have you tried these.....

NEW INDUSTRIAL PRODUCT

cate and glues securely under a wide range of glueing conditions, it is a favorite of the pattern maker. And the wood has exceptional stability in retaining original dimensions, As an illustration—during World War II in the Pacific one U. S. ship replaced a damaged part with a recasting from a redwood pattern made 26 years earlier. It was still accurate in every dimension.

Foundry pattern receives a check for accuracy. Redwood may be worked without difficulty with either hand or power tools. It does not contain pitch or resins.

Air pollution is a problem bringing growing public pressure upon industry to "do something." Here, again, redwood is favored for towers to reduce or eliminate noxious gases.

Basically these redwood scrubbing towers wash gases and prevent them from escaping. Since many gases, when dissolved, form dilute acids which would corrode most metals, engineers now rely heavily on redwood for scrubber installations. Redwood combines ease of maintenance and ruggedness, both essential for economical, trouble-free operations.

One such unit was designed for Standard Oil Company's lubricating oil plant in Portland. This tower removes sulphur dioxide fumes from waste gases.

Another impressive redwood installation is the forest of towers at the Mead plant, Kaiser Aluminum and Chemical Corp., Spokane, Wash. Here 16 scrubbers, each 10 ft. in diameter and 50 ft. high, purify escaping smoke. This elaborate smoke-wash system "pays it way" because the installation has reduced loss of expensive Cryolite, a Greenland import essential to ore processing, by 50%.

When Tidewater Associated Oil Co. increased its Suisun Bay, Calif., plant capacity it solved a perplexing heat problem arising from refinery operations by constructing a huge 11-cell redwood crossflow cooling tower. This structure, as tall as a four-story building, required more than 400,000 board feet of redwood heartwood, plus two lengthy redwood stave pipes almost large enough for a man to walk through. Some 55,000 gal. of hot water are circulated through the system each minute. The water returns 25 deg. cooler to the coking plant. This is a total heat dissipation of 700,000,000 Btu's per hour.

Redwood piping does the job

United States Potash Co. uses a 600-ft. redwood pipe line capable of whisking some 30,000 gal. per min. from the Pecos River to the firm's Loving Refinery. The line runs part of its length underground, rising on a steel trestle before discharging into a battery of water softeners which remove the high percentage of dissolved solids characteristic of the Pecos River. Redwood keeps the water cooler than metal piping would in this hot-weather locale, and is impervious to the river's chemicals.

Another application of redwood piping is for ocean intakes at Kaiser Aluminum and Chemical Corp.'s Moss Landing, Calif., sea water magnesia plant. Here a 36-in. diameter redwood stave pipe trails upward from off shore. The piping is immune to salt and weather and requires little maintenance. Redwood stave pipe accommodates itself to different terrain and this benefit meant substantial savings in fabrication time for the sea water installation.

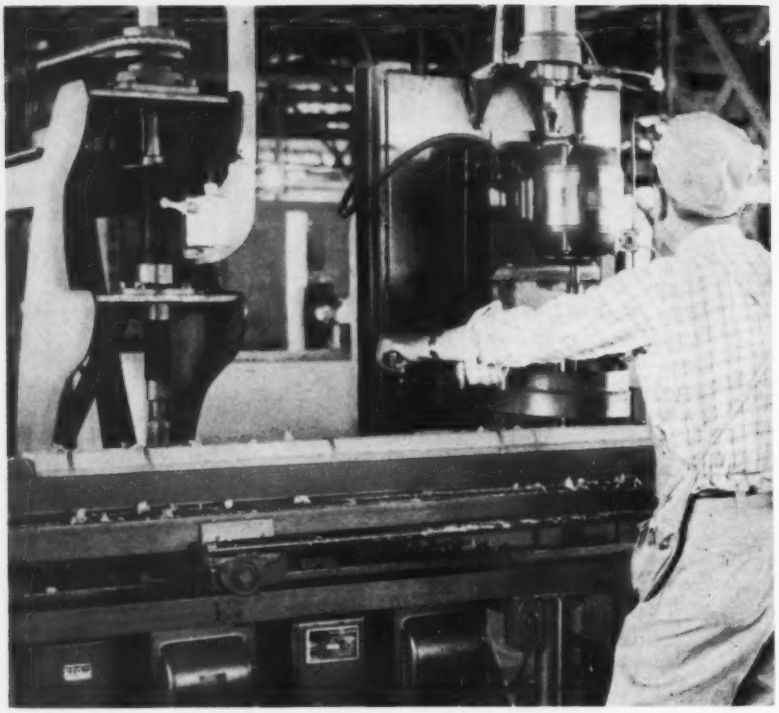
Weather, rot, insect resistant

Redwood is weather, rot and insect resistant—good reasons why more than 65,000,000 bd. ft. went into cooltowers alone last year. Also a redwood unit does not constitute a fire hazard in the industrial plant because it is difficult to ignite and slow to burn. The wood is free from resinous material, and the heartwood of redwood is decay resistant because it contains elements toxic to the action of the various types of fungi and insects.

No paint is required to preserve redwood, but if paint is desired for decorative purposes, it will take and hold a paint finish exceptionally well. This durable wood has the lowest volumetric shrinkage of any commercial American wood. Small shrinkage, of course, means a minimum tendency to check and warp, and therefore structural features are maintained to a high degree.

Information concerning redwood is available from the U. S. Forest Products Laboratory, Madison, Wis.; the California Redwood Association, San Francisco, and the Simpson Redwood Company, Arcata, Calif.

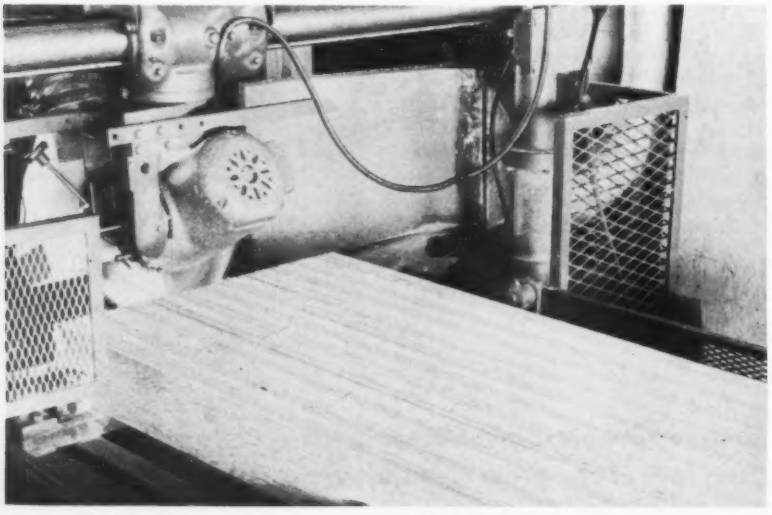
tanks and vats, cooling towers, bins, scrubbers, pipe, filter presses, patterns, spindles and bearings, insulators, etc., are just a few of the products made from this lightweight and highly resistant wood.



DRILLING AND TAPPING combined in one operation in this new setup. Wood pipe is in a jig which moves under two machines.

Batting ideas around a table to score production home runs

80 SHEETS OF PLYWOOD can be cut in dado machine at the same time with "brainstormed" equipment. Here angled saw blade makes a cut.



BATTING IDEAS AROUND a conference table has resulted in a wealth of practical, cost-cutting methods and machinery at Fluor Products Company's big new plant near Santa Rosa, Calif.

Brainstormed machines (either specially built because nothing was available on the market, or by using standard machines and parts) are now in daily use, increasing the plant's output of such industrial wood items as refrigerated cooling towers, tanks up to 120 ft. in diameter, gas scrubbing towers, wood stave pipe and power line pole cross-arms.

Improved techniques became a must when the production rate increased some 50% in 1957 over the previous year. Now, a 177-man force turns out about 1,000 different fabricated wood items at the average rate of 450,000 board feet a week. Volume averages 15 rail cars and four truck-trailer loads a week, and products are shipped around the globe.

The Santa Rosa facility is a straight-line operation in which raw materials, chiefly redwood, move in logical order through receiving, fabrication and assembly to the loading docks. There is a minimum of manual operations.

Steps in manufacturing a typical product such as cooling tower stock begin in the remanufacturing area where lumber is ripped and cut to dimension. Fork lift trucks convey 2½ tons of stock at a time to breakdown hoists. The wood is fed into resaws or planer-matchers with double-ended trim saws for cutting to length and surfacing, then moved to sorting tables.

All parts are milled to exact specifications, surfaced, cut to length, drilled, dadoed, slotted or given other detailing. Lumber for other products travels a similar route through other departments. Raw material is color-coded.

According to *Buzz Poulter*, general superintendent, "We had certain objectives in mind when setting up this plant two years ago: to improve the product by exactly controllable precision work, and at the same time to decrease spoilage; to lower costs of finished assemblies, and to increase productivity to a point where demands could be met without overtime work so that we could meet shipping schedules."

The company's production brass and engineering force rely on brainstorming sessions, not only to improve the finished quality of their products,

but to find better ways of making them. Here are some of the practical results of those sessions:

1. Two 42-inch Turner twin-band resaws have been set up in tandem to handle dimension lumber and small squares. Where formerly only seven pieces were obtained from a length of 4 x 4, production has passed 10 pieces: to be exact, a 43% increase in net product. There is less sawdust and more "merchandise." The saws may be worked in tandem but they are on individual mounts so that they can be used independently. Also, this same station can now turn out in volume about seven other parts that formerly could only be made by tedious cutting and planing.

Output has been stepped up from 100 to 300 linear feet per minute; however, the saws can be slowed to handle down to 30 feet per minute. One saw has a 45-degree tilting bed so it can rip or resaw diagonally. The saws don't wander and they don't tear up wood like the old gang rip saws. One man now runs the station previously manned by a crew of up to five.

2. Just off the resaw, two unique off-bearing and sorting tables are located. The largest is 48 feet in diameter and travels with a peripheral speed of 30 feet per minute. As lumber comes off the resaws it shoots onto the table and is graded for quality control. Bad production has been slashed two-thirds by the round table method; less manpower is needed because pieces missed on the first pass come around again and can be culled out by a minimum crew. The rotating tables replace a "green chain" inspection line.

3. Fir plywood batts for breaking up water spray in cooling towers are being produced at least 50% faster, with one operator now doing a job that used to require six men. Superintendent Poulter credits a brainstormed dado cutter which he said has paid for itself several times over in the first few months of use. This station turns out about 2,000 pieces a day of ⅜-inch CC exterior grade fir plywood four to six inches wide and four to six feet long, having up to 63 dado cuts on two edges.

The old practice was to use six men dadoing with radial arm saws to make cuts ranging from 25 degrees to vertical, 2½ inches on center. Operators used to do five pieces at a time. Now one man runs a machine that cuts 80 pieces at a time, once it is loaded. The operator and a helper spend 90 minutes each morning breaking down the 4 x 4 and 4 x 6-ft. panels on a multiple rip saw in front of the dado machine —then the helper is free to work in other departments the balance of the day. Electronically-controlled, the dado head moves back and forth over the edge-stacked pieces, making a cut at each stroke to a predetermined depth and pitch.

4. Wood lateral pipe for cooling towers is equipped with Fluor-patented cast plastic spray nozzles at precise intervals. The old way to prepare the pipe for the insertion of nozzles was with portable power tools. Now production has been trebled on this operation and precise standards are possible which formerly could not be realized. The solution lay in a shop-made drill and tap machine in which one head drills while the next head threads the hole. Wood pipe 12 to 24 inches in diameter, banded with stainless steel, is held firmly in a jig during the drilling and tapping operation. A perfect thread is thus cut into the redwood and spacing is precise. On a man-hour basis this machine has upped production 300%.

5. Cutting and fabricating of wood grid decks was formerly done at two separate stations. Production was limited as to the length and width of materials that could be used without increasing costs. Fluor brainstormed a drastic reduction in this phase of manufacture for finished parts costs, reduced the number of hours involved and more than doubled productivity.

It is now possible with the newly-designed equipment to feed any width of rough one-inch lumber from three to 12 inches wide and from six to 18 feet long. One man, standing in one position, now controls the entire operation with two electric foot switches. The machine cuts lumber to predetermined precise lengths and breaks lengths up into five precision-trimmed pieces.

It also cuts lumber into any required width at any adjustable pitch of the saws and delivers finished cut-up parts to any one or all of three stations. Parts that are ready for assembly into grid decks are automatically delivered to a 46-ft. surge conveyor chain. There are always on the chain enough parts to keep the nailing crew going for half a day even if it becomes necessary to divert the machine to cutting other parts.

On the nailing conveyor, workmen simply slip wood parts into a metal jib on a continuous belt. Then a hopper-fed nailing machine drives nails home to join all the parts at three different angles with three strokes.

6. There is also a Fluor-designed precision double-ended trim saw made in the Santa Rosa shop. With this machine, three men are now able to produce 18,000 pieces a day to exact dimensions, as compared to the old method of cutting 3,600 pieces a day with radial arm saws.

By the development of such equipment, Fluor Products Company has transformed the sounds in the California meadow it occupies from the sleepy drone of bees to the busy hum of pace-setting production.

EVEN apparently silly suggestions may sometimes result in sound improvements. Brainstorming consists of gathering a group of interested parties around a table and encouraging each one to contribute his thoughts on a particular problem.

The technique is said to have been originated by BBD&O's Alex F. Osborn. Now brainstorming is a regular service for this ad agency's clients.

It has been described as "a recourse to the subconscious." Ideas, even seemingly outlandish ones, may perhaps trigger solutions.

As reported by the Wall Street Journal, a telephone company experimented with brainstorming by asking 100 of its employees, divided into round-table groups of 15, for ideas on recruiting new operators. To management's astonishment, the group came up with 150 ideas in 20 minutes. Some were unworkable, but others, such as a suggestion for handing out "introduction" cards to friends and relatives, were put into practice.

Brainstorming can be effectively used on problems relating to production, sales, material handling or any phase of industry.

Its practitioners recommend grouping men and women of approximately equal status, and avoiding ridicule and "killer" expressions.

One company, on the verge of installing a $200,000 conveyor system, submitted it first to a brainstorming session. Result: an adequate $4,000 system. Savings: $196,000.

Give handling a lift — when you up production

New equipment brought material handling costs down to new low.

ARE YOU GIVING your material handling operations a lift when you boost production?

Yes, Western plants are stepping up production but sometimes there is a lag in corresponding functions, such as material handling. But not in the case of the E. J. Gallo Winery at Modesto.

The Modesto plant was using pallets and unitized loads transported by lift trucks. There was nothing wrong with the system, except that increasing emphasis had to be placed on *speed, maneuverability, stability* and *ease of operation.*

These considerations dictated, in the minds of Gallo officials, newer model lift trucks. Coupling the purchase of new material handling equipment with "a decided concentration on engineering advancement" has resulted in giving the company an operating situation in which "actual physical handling and packing costs are probably the lowest ever enjoyed," according to *John Wilson*, a Gallo official.

The Modesto plant is the sole production site for Gallo Wines. In a modern, eight-building layout, the company receives grapes, many from their own vineyards, and crushes and ferments them into wine which is aged, bottled and shipped all over the country.

Gallo operates a fleet of nine electric powered lift trucks to keep its six, year-round bottling lines turning out 32 different types of wine. The trucks deliver palletized loads of cases of empty bottles to the lines and remove similar loads of full bottles from the lines either directly onto shipping vehicles or into storage.

The company started the use of pallets and unitized loads eleven years ago. This initial usage was accomplished with gasoline powered trucks and was limited to areas where exhaust fumes did not present a problem.

In 1953, in order to extend palletized handling throughout the bottling operation, and keep pace with a steady production increase, a fleet of nine electric powered lift trucks were put into service.

This year, Gallo replaced this fleet with 3,000-lb. capacity models of the recently introduced Yale K51W line of electric trucks as a further modernization step.

The switch to the new equipment was the result of a need to solve a number of problems which were hampering a smooth economic production flow under the pressure of increased volume at the Gallo plant.

First, the company warehouse had to be enlarged to handle the increased volume with the result that lift trucks had to make longer runs between production lines and storage. For this reason, Gallo went to later model trucks to get more *speed of travel*, and, as a further time saver, *faster lifting and lowering speeds.*

Then, in addition to a larger warehouse, the company sought to increase storage by cutting aisle space thereby requiring a shorter, more *maneuverable* truck.

These factors of increased speeds placed a further requirement into the picture—that of stability, particularly around corners because of the lowered operating room for trucks.

Ease of operation was a final factor in the changeover since operators would be required to work over wider areas, faster and in more confined spaces.

A great deal of the time Gallo's trucks are in operation for 16 hr. a day. The trucks used to feed the production lines and carry away cases of filled bottles are supplied with extra batteries so that a freshly-charged power unit can be put into a truck at the end of an 8-hr. shift.

Company officials report trucks in use on the loading ramps which are not in steady service unloading cases of empty bottles and loading out shipments normally can be operated the full 16 hr. without recharging.

Foolproof shipping method developed for small metal lots

A FOOLPROOF METHOD for shipping small lots of metal without damage has been developed by the Ziegler Steel Service Corp., Los Angeles.

Permanent crates with hooks attached (so they can be lifted vertically by cranes) and with hinged rear door (to receive sheets) can be transferred to any of the seven trucks in the Ziegler fleet and transport the metal to destination.

This method has eliminated the use of small skids, and greatly speeded the delivery of metals. And it assures that the metal will arrive in perfect condition, regardless of any heavy load that might be stacked on the crates.

Permanent crate is lowered into Ziegler Steel Service truck.

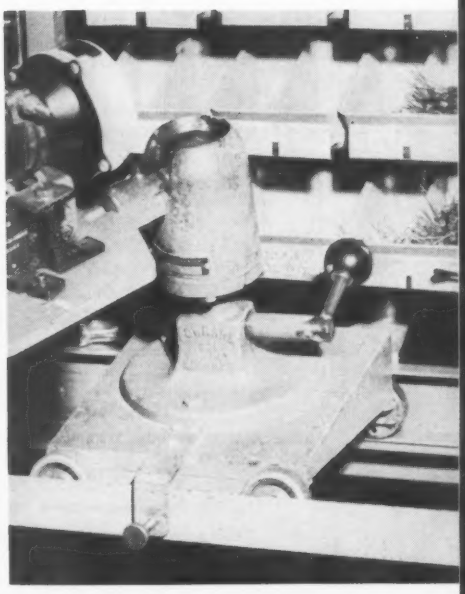
New assembly equipment saves $150,000

KEEPING PACE with increased production and changing conditions is an ever-present problem in Western industry. Flexibility is a "must" in this missile age. The aircraft industry in the West can be proud of the part it's played in this role. Here's the story of how Hughes Aircraft Co. saved $150,000 with new assembly equipment. How did they do it? Just by taking standard products available on the market and building them into their assembly work stations. You'll get some ideas for your own setup—it can save you time and money.

ABOVE—The compact, time and money saving result. A place for everything—everything in its place. With this setup, assembly gals can assemble a part faster than they can whip up a "just add water" cake.

LEFT—Assembly instructions are in sequence on a "lindex," which formerly was in a rack above the operator. The new lindex is a continuous blueprint roll that can be turned forward or backward and has been brought closer to eye level of operator for convenience.

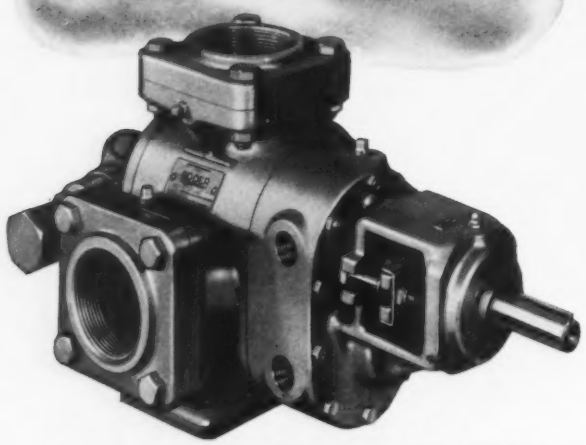
RIGHT—Four-wheel dolly moves freely on any size track that is in the plant's assembly areas. The lever-type lock holds its position and allows the power arm a 360-deg. turn while the dolly is locked in position.



LEFT—With new holder for solvent bottles, one hand will open bottles and wipe excess liquid from brush. Its introduction frees a parts cup previously used as a holder. One of the savings is in breakage and spilling, once a costly item.

RIGHT—Single unit (right) replaces former two holders at left, providing for all tools in one location. It fastens outside the track so dollies can be moved from station to station without having to remove the combination tool holder each time.

NEW ROPER PUMP WITH STEAM CHEST



LOW COST METHOD OF HEAT TRANSFER TO PUMP AND PACKING

Capacities from 27 to 223 GPM
Pressures Up to 100 PSI

This is the same Roper Series 3600 Pump as found in general transfer installations, but with the added feature of a steam chest. A rotary gear unit, it is available with or without relief valve . . . also furnished with gear reduction, if desired.

TWO TYPES OF CONSTRUCTION:

Spec. 3878 Fitted with Bronze Bearings
Spec. 4049 All Iron Construction
All Units Fitted with Aluminum Gaskets and High Temperature Packing

Steam Chest: Located between case and outboard bearing to transfer heat to both pump and packing. A low cost method for handling thick, viscous liquids. Can be used with steam, hot water, or heat transfer oil. Pump and steam chest static tested at 300 PSI. Recommended pressure with steam is 125 PSI.

- **Four ports in steam chest for installation convenience.**
- **Hardened gears and shaft precision ground; steel shaft induction hardened.**
- **Equipped with high temperature packing (600° F. max.) for effective sealing and long life. Pump fitted with aluminum gaskets.**

Send for Bulletin No. 29

ROPER HYDRAULICS, INC.
formerly
Geo. D. Roper Corp., Pump Division
2011 Santa Fe Avenue
Los Angeles 21, California

ROPER *Rotary Pumps*

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Metal alloy use simplifies design, reduces cost ¼

Rapid deposition results in thin, handsome welds which minimize cleanup and allow 25% savings in labor costs.

CAREFUL THINKING teamed with a metal joining alloy enabled a California steel furniture manufacturer to simplify design and reduce costs by almost one-quarter.

Previously, using conventional welding material, cross bracing between legs was necessary and costs mounted because of difficult angle joining and the necessity of finish grinding.

Then it was decided that welding alloys provided the answer.

Parts to be joined were cleaned thoroughly and a specially formulated flux was painted on the joint areas. Metal was heated with a neutral flame until the flux liquified and the base metal turned a dull red. The welding alloy was then applied and heated until it penetrated the joints.

Because of the low bonding temperature of the alloy, which minimized warping, coupled with its unusual strength up to 100,000 psi., engineers were able to design a one-piece suspended chair arm, and incorporate angled legs of varying diameter and metals.

Rapid deposition resulted in thin, handsome welds which minimized cleanup work and allowed a big 25% savings in labor costs.

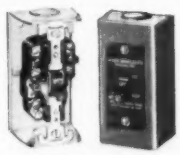
Unusual joint strength of EutecRod 16 FC, manufactured by Eutectic Welding Alloys Corp., permitted use of thinner steel tubing and eliminated the need for cross bracing between legs.

By adopting this thin flowing, high strength alloy, not only have costs been cut and style improved, but years have been added to the service life of chairs.

THE "SIGN" OF

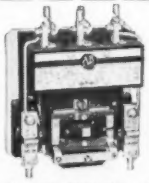
trouble-free

MOTOR CONTROL!

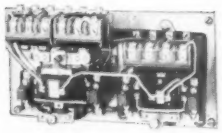


Bulletin 600 Starting Switch with reliable overload breaker. Rated 1 hp and below.

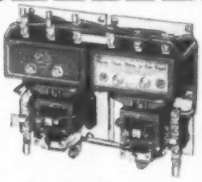
Bulletin 609, 3 Manual Starter. Max. rating: 5 hp, 220 v; 7½ hp, 440-550 v.



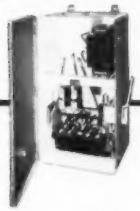
Bulletin 709 Size 4 Automatic Starter—50 hp, 220 v; 100 hp, 440-550 v.



Bulletin 715 Size 1 Two Speed Consequent Pole Starter.



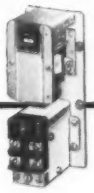
Bulletin 705 Size 2 Reversing Starter. Max. rating: 15 hp, 220 v; 25 hp, 440-550 v.



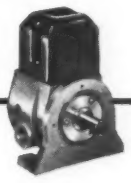
Bulletin 646 Manual Autotransformer Starter.

Bulletin 802T Oiltight Limit Switch.

Bulletin 802 Oiltight Precision Limit Switch.

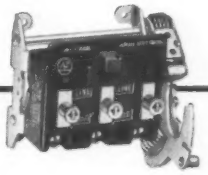


Bulletin 849 "On-Delay" Pneumatic Timer.

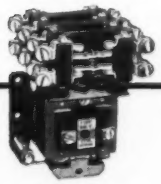


Bulletin 808 Zero Speed Switch.

Bulletin 704 Mechanically Held Relay. Noiseless.

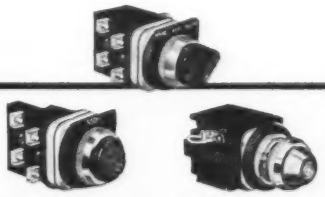


Bulletin 894 Visible Contact Disconnect Switch.

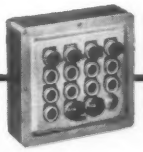


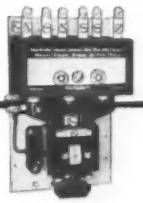
Bulletin 700 Universal Relay with N.O. —N.C. Contacts.

Bulletin 200 Direct Current Relay.



Bulletin 800T Oiltight Push Button, Selector Switch, "Press-to-Test" Pilot Light, and assembled Oiltight Station.





Bulletin 702 Three Pole, Size 3 Contactor—100 ampere.

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SEATTLE 1—J. A. Tudor & Associates, Inc., 2605 Western Ave., Tel: Mutual 7444

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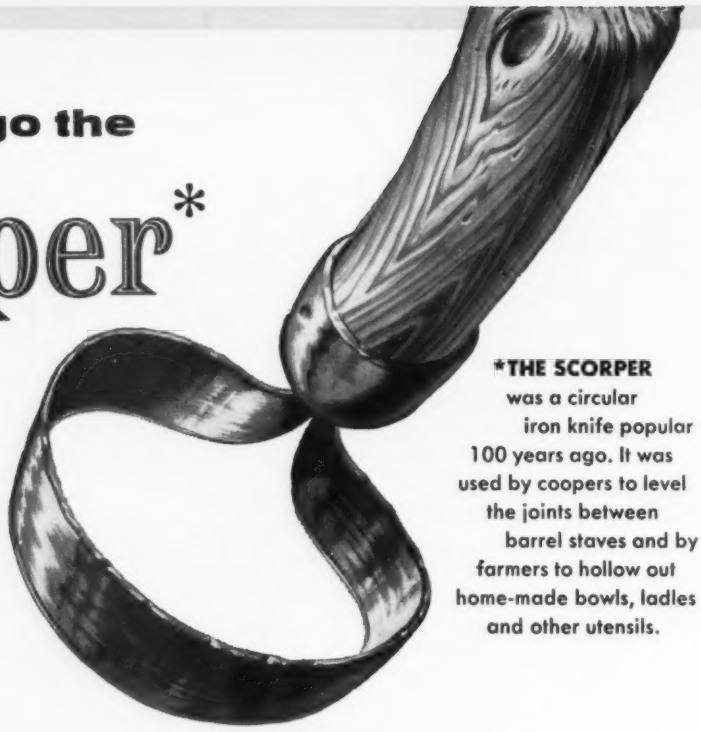
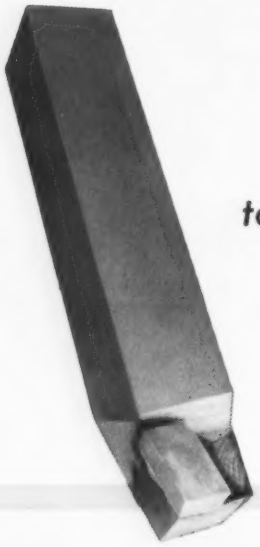
A century ago the

Scorper*

nibbled off wood shavings...



***THE SCORPER** was a circular iron knife popular 100 years ago. It was used by coopers to level the joints between barrel staves and by farmers to hollow out home-made bowls, ladles and other utensils.



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Part II:

COST REDUCTION IDEA-BOOK

Conveyor with no return belt cuts handling errors to 0.5%

BY USING a conveyor with no return belt, Sunset House Distributing Corp., one of the nation's leading mail order firms, has cut total handling errors to 0.5%—which is a miracle considering the size of the operation.

case history 76

Founded seven years ago to sell inexpensive gifts and household items by mail, Sunset House does no manufacturing, but purchases its products from outside sources.

The firm really mushroomed and personnel was increased from three persons to almost one hundred—but this very growth created a headache by taxing the company's inadequate facilities almost to bursting point.

When orders reached 4,500 a day, (involving 8,000 separate items,) Management Systems, Inc., was called in to analyze the company's problems and make recommendations for a completely integrated plant.

And after consultation with a conveyor manufacturing company, up came the novel idea of using a conveyor with no return belt.

A conventional system would have required four belts totaling 416 ft. and approximately 40 return idlers. But by using the rectangular conveyor with no return, no idlers were needed and the belting was held to 208 ft.

Here's how it works.

Incoming merchandise is moved by flat and hand truck to flow bins where it is sorted and stocked. "Pickers" fill their orders from these flow racks, placing the items in cardboard tote boxes. Since the average order weighs less than 2½ lb., the cardboard boxes are more than equal to the task, and easy to handle, as well. Orders are moved along the conveyor to the inspectors and then sent to the carton selector, who chooses a flat carton according to the size of the order and places it atop the tote box.

Packers remove tote boxes from the conveyor, package the contents and send the empties on their round trip back to the pickers. Completed packages are sent down a gravity feed roller to the scalers who zone them and apply correct postage.

This tailored conveyor system, manufactured by the M. E. Canfield Co., added to the smooth operation at Sunset House so greatly that the firm is presently handling about 6,000 orders a day.

PICK 'N PACK—Pickers at Sunset House fill orders from flow racks, placing correct items in tote boxes and sending them along conveyor belt to inspectors.

For cleaning the tops of pistons, Missouri-Pacific shops use a 1 in. x 6 in. PG wheel manufactured by Minnesota Mining and Manufacturing Co.

Abrasive wheel saves 50% time on cleaning jobs

SMALL "PG" wheels have replaced wire brushes and abrasive sleeves for cleaning operations at the shops of the Missouri-Pacific Lines, cutting cleaning time by 50%.

case history 77

Removing carbon deposits from the tops of pistons, cleaning the inside diameters of cylinder housings and the outside surfaces of cylinders, as well as removing dirt and grime from the inside cylinder walls of roller bearing housing, are just a few of the wheels' uses.

Shopmen report that the finish produced by the "PG" wheels is smoother and more consistent than was obtained by other methods, and that the wheels offer a safer and relatively clean operation. In addition, as compared with the previous use of abrasive sleeves, there is no downtime for a change of abrasive due to loading.

The Mo.-Pac. shops are using aluminum oxide wheels grit 80 with the resin bond and cloth backing.

On the inside diameters of the diesel engine cylinders, the wheels are being employed on a flexible shaft machine and are running at 3,400 rpm. Less pressure is required on the part of the operators than is necessary with a wire brush, and their observations are that

the wheel removes the carbon deposits "twice as fast."

A portable air grinder powers the "PG" wheels at 4,500 rpm. for cleaning the roller bearing housings in another part of the shop. These are gray iron castings, and are stoutly resistant to abrasion. To achieve the desired finish with abrasive sleeves, it was necessary to use a grit 80, which cut slowly and filled rapidly with the dirt and grime being removed.

With a grit 50 coated abrasive wheel, operators are producing a finish comparable to—or finer than—a grit 80 sleeve, in less time.

For cleaning the sides and tops of pistons the Missouri-Pacific is using a 1 x 6-in. wheel. Regardless of size, the wheels are flexible enough to follow mild contours, yet still retain their original shape.

Other operations for which "PG" wheels, manufactured by Minnesota Mining & Mfg. Co., are recommended include paint and rust removal from engine or car surfaces. Because of the wheel's ability to produce a finish up to two grits finer than a comparable grit abrasive sleeve or belt, a single grit wheel can often be used for paint removal as well as surface preparation for repainting. In instances where the surface requires grinding, the small "PG" wheels may be employed following a disc operation.

Elsewhere in the shop, resin bond "Type C" discs are used for heavy grinding such as weld removal and cut down, and coated abrasive belts are utilized on portable machines as well as bench and floor backstands.

It need never be removed for servicing and harmful solids which might otherwise damage pump gears are removed by an inline visual strainer (visulator) at the same time providing a visual method of determining when total fluid has been thoroughly purified.

"Impossible to handle" acid fumes meet their match in this material

A NEARLY "impossible-to-handle" mixture of hot nitric, hydrofluoric and phosphoric acid fumes, which attacks and destroys any other known material, has met its match in rigid Koroseal, a material that was developed and manufactured by B. F. Goodrich Industrial Products Co.

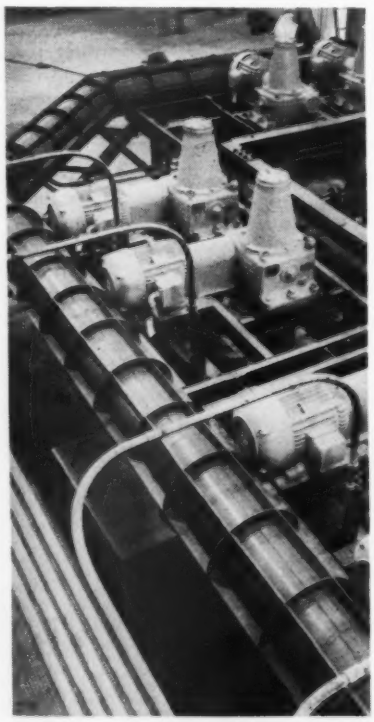
case history 78

Installed at California Spray Chemical's new complex fertilizer plant in Richmond, Calif., a circular duct made of rigid Koroseal conducts the corrosive fumes at temperatures up to 150 deg. F. The once "impossible" mixture has no effect on the Koroseal ductwork. The severe service conditions result from an advanced manufacturing process at the plant which is unique in the United States.

The duct measures 13 in. in diameter with a ¼-in. wall, is made of normal impact, rigid Koroseal sheet and is reinforced with flanges and longitudinal webs for operation under a vacuum of two to three in. of water.

The system was engineered and fabricated by the New England Lead Burning Co., San Leandro, Calif., fabricator and distributor of rigid Koroseal material in northern California. Chemical and Industrial Corp. of Cincinnati, Ohio, installed the ducts.

California Spray Chemical manufactures various complex fertilizers from phosphate rock, nitric acid, phosphoric acid, sulfuric acid and ammonia. The Richmond plant was designed by Chemical and Industrial Corp. and uses the PEC process.



Koroseal duct system proved to be the answer to handling a mixture of hot nitric, hydrofluoric and phosphoric acid fumes.

Trailer conveyor averts disaster; gets rice to table

THE RICE ON YOUR dinner table may be there through the courtesy of a metal pipe and hose and a low pressure conveyor.

case history 79

During the Feather River flood at Yuba City, Calif., a trailer conveyor unit was responsible for saving approximately $80,000 worth of paddy rice, which was stored in bins endangered by flood waters.

An Airveyor unit was dispatched from Sacramento 50 miles away, and recovery operations began within an hour after arrival. In spite of rain drenched ground, it required only two men to manipulate the lines and carry out the entire operation.

Regular mechanical conveyor equipment had been put out of action due to a stoppage in electrical power. But by working around the clock, at a rate of 33⅓ tons an hour, a total of 1,600,000 lb. of rice was removed.

At the Rice Growers Association plant outside Sacramento, portable equipment manufactured by the Fuller Corp. is occasionally used to supplement a stationary Airveyor system in unloading railroad boxcars. Both systems deliver from the car to elevator boots which convey rice into bins prior to milling.

Revamp; standardize to up quality—lower labor costs

SAVINGS of 15% in manpower and 80% quality improvement in furniture finishing have been achieved by California Furniture Shops, Ltd., Los Angeles, by careful production planning and the use of standardized equipment.

case history 80

Rigid production control is most evident in the finishing department where a paint circulating

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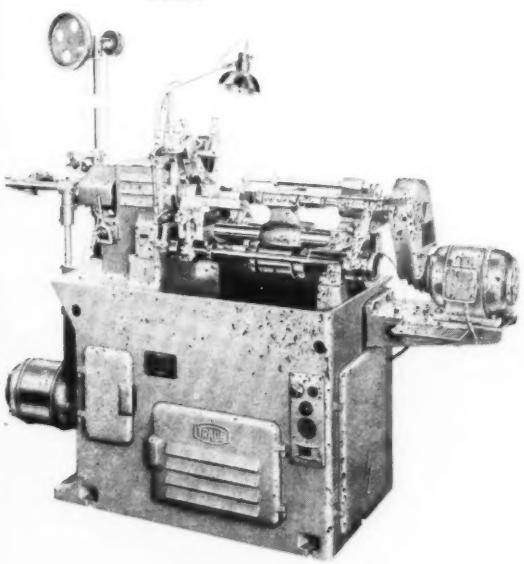

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. . . for more details, circle No. 30 on Reader Service Postcard

Two-station Binks Dynaprecipitor water wash spray booth in action. Operators, working back to back, use Binks model 19 spray guns to apply uniform finishes.

system, water wash spray booths, spray guns, oil and water extractors and fluid pressure regulators assist operators in applying a hard, durable finish to the furniture.

The first step in finishing comes when parts are placed on a pallet which rides on an endless chain conveyor—moving at only 2½ ft. a min. to allow time to thoroughly coat the odd-shaped and different-sized pieces.

As the conveyor enters the first of six specially designed 10-ft. wide Dynaprecipitor booths, the pieces are manually sprayed with stain. Spray guns are used to apply this initial coating.

The furniture then moves to another booth where a sealer is applied, then through a second sealer booth to glazing and finally to a booth where hot lacquer is applied.

As each piece is sprayed, the Dynaprecipitor action draws the overspray through a continuous curtain of moving water. Paint and stain particles are further removed by centrifugal force as the air makes a 180-deg. turn when it reaches the water wash.

The scrubbing action washes the particles into a collecting pan at the base of the booth. Virtually all overspray is removed from the air before it is exhausted to the outside by fans. In the collecting pan, chemicals in the water mix with the paint, causing the latter to float so that it can easily be removed.

The furniture company also installed a paint circulating system. Heart of this system is a battery of air-operated material handling pumps directly mounted on 55-gal. drums containing the various coatings, and housed in a specially constructed 750-sq. ft. cement vault.

From this vault the materials are pumped through annealed steel tubing supply lines to their respective booths and stations. This insures a constant, uniform supply of stains, sealers, lacquers and glazing materials at each station—and eliminates color variation.

When it is necessary to replenish the paint supply, a button is pressed to automatically lift the pumps and agitators out of the empty drums. A new drum is quickly put in place of the old, and the pump is lowered into it pneumatically, maintaining a clean, safe work area.

By a combination of standardized equipment manufactured by the Binks Manufacturing Co., Chicago, and careful production planning, furniture is shipped to consumers in flawless condition.

Hardfacing provides life insurance for rollers in crusher

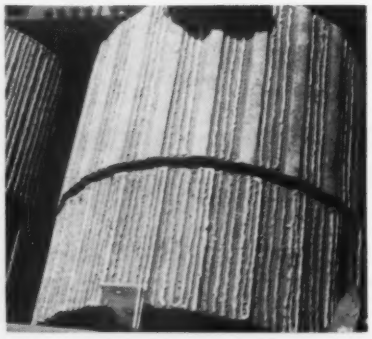
CRUSHING BASALT rock is a wearing business—especially on the rollers in a crusher.

case history 81

And although the rock crushes easily, it is extremely hard and highly abrasive.

One crushing operation in Wasco County, Ore., has solved the problem by hard-surfacing new equipment before use, to prevent excessive wear of surfaces during the work hardening period.

Rollers hardfaced with Victor O semi-automatic wire.



Result—original roller size is maintained.

Hard-surfacing is done with 200 lb. of Victor O semi-automatic wire, size 7/64 in., and 50 lb. of Tube Victorite coated for finish work around the roller edges. Longer crushing life quickly pays for the rods.

And after hard-facing, the rollers showed no appreciable wear after crushing 3,100 tons of extremely tough basalt—which proves there's a form of life insurance for rollers, too.

Giant cleaner sucks up dust; clears the air

A GIANT "vacuum cleaner" that uses 780 15-ft. bags and that occupies its own four-room building has been installed at the Torrance, Calif., plant of The National Supply Co. as part of the management's continuing fight against air pollution.

case history 82

The $125,000 system, which serves the electric melting furnace department, is capable of moving 75,000 cu. ft. of dust-laden air per min., compared to 28,000 cu. ft per min. moved by the system formerly used. Because of its efficiency, even the finest particles of dust are trapped, allowing only clear air to be discharged to the atmosphere.

Ducts over each of the electric furnaces carry all smoke from the melting operations to the new building known as a "baghouse," in each room of which are suspended 195 dacron bags, 15 ft. long and 6 in. in diameter. Acting much like the bags of household vacuum cleaners, they collect all the dust from the air that passes through them. Once an hour, one room at a time is automatically shut off from the system for ten seconds, during which time the bags are shaken vigorously, causing the dust to fall from them into a collecting hopper at the bottom. From this hopper, the dust is carried by a conveyor to a discharge chute where it is mixed with water to form sludge. At intervals the accumulated sludge is hauled away to a dump.

The former system used close-fitting collecting hoods mounted on top of the melting furnaces. From these hoods, the dust-laden air was carried by ducts to a large collector in which it passed

. . . for more details, adv. opp. pg., circle No. 31 on Reader Service Postcard ➡

Missiles designed to soar out of this world

...are sped by liquid oxygen from LINDE

Oil, kerosene, and alcohol "burn" by combining chemically with oxygen from the air. But it takes pure oxygen with these fuels to speed rocket planes faster than sound . . . to drive missiles beyond the earth's atmosphere.

Liquid oxygen, vital to today's rocket engines and many types of missiles, was being produced by LINDE as long as 25 years ago. In fact, LINDE has been supplying oxygen to industry for more than 50 years. LINDE pipes oxygen directly to industrial users from nearby oxygen plants built and operated by LINDE. The user makes no capital investment, and pays only for the oxygen consumed —at a price guaranteed by LINDE.

LINDE also developed methods for transporting liquid oxygen efficiently, in large and small amounts, at 300 degrees below zero F. You can get LINDE oxygen in just the quantity you need, at the exact time and place you want it, as a liquid or a gas.

For detailed information about LINDE oxygen, write Dept. WI-2, LINDE COMPANY, Division of Union Carbide Corporation, 22 Battery St., San Francisco 6, Calif. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

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through a curtain of water. Only small quantities of the finest particles of dust escaped to the air, but these caused a visible discharge that brought complaints of air pollution.

Another disadvantage of the former system was that its smaller capacity prevented collection of the quantities of smoke that result when gaseous oxygen is injected into melting furnaces. Because of this, the plant could not use the gaseous oxygen method, employed by most steelmakers, which results in greater efficiency.

With the new system, manufactured by the H. J. Horrell Co., Los Angeles, in cooperation with engineers of National Supply (the baghouse was designed by the Dracco Corp. Cleveland,) gaseous oxygen can be used with no danger of air pollution.

View of baghouse, showing truck in position to receive discharged sludge. System manufactured by H. J. Horrell Co.; baghouse designed by Dracco Corp.

Battery of powered lift trucks solves space, storage problems

SPACE AND STORAGE problems at the H. C. Smith Oil Tool Co. of Compton, Calif., have been solved.

case history 83

Manufacturers of drill bits, with a multiple building operation, they found it necessary to reorganize their machine shop buildings to provide space for more machine tools.

The smaller aisles and closer positioning of machines made it impractical for large gas trucks to deliver and remove pallet boxes from machine locations. And storehouse operations had to be consolidated to conserve space for finished parts.

Battery-powered trucks with hydraulic lifts used to solve this space and storage problem.

Despite the weight of machined parts, a light duty lift truck of 1500-lb. capacity was selected. Not being a cantilever type, it was possible to use very narrow aisles and yet stack the pallet boxes 5 high in the storeroom and 2 or 3 high in production areas.

Construction of the boxes enables the gas fork trucks to handle more than one box between the buildings and the heat treat department, where another light duty machine does essentially the same job with comparable savings.

The trucks, suggested by McKinley Equipment Corp., Los Angeles, Calif., are battery powered and are equipped with hydraulic power lift. Chargers are built into the trucks making it possible to charge them near the work station. They are used in both non-telescopic type for short lifts and telescopic for maximum height utilization in the storeroom.

Use of these machines for intra-department handling has relieved the larger trucks for longer hauls and maximum loads and outside work.

Six machines are now in operation at a total capital outlay of slightly more than one larger capacity gas fork truck.

For door openers: vinyl hinges pack plenty of muscle

EVER OPEN a door 25,000 times? This is more flexing than most doors receive in a lifetime, and only made possible by extruding tough vinyl resins into hinges which resist cracking and tearing even when subjected to tests over wide temperature ranges.

case history 84

The Bakelite vinyl material used resists chemicals found in cleaners and waxes as well as paints and lacquers.

Designed for use as space-saving doors or room dividers, the units have vertical panels of kiln-dried wood 7/16 in. thick. And the vinyl hinges have T-shaped edges that are securely anchored in slots in the edges of the panels.

Lightweight and easy to install, these folding doors are suspended by gliders from a track at the top of the wall opening—doing away with any need for floor tracks.

Space-Saver doors, manufactured by Wood Specialty Products, Inc., are furnished, completely assembled, in packages containing upper track, hardware (including screws, gliders and stud-and-bullet catch), track backing, matching wood valance, door handles and installation instructions.

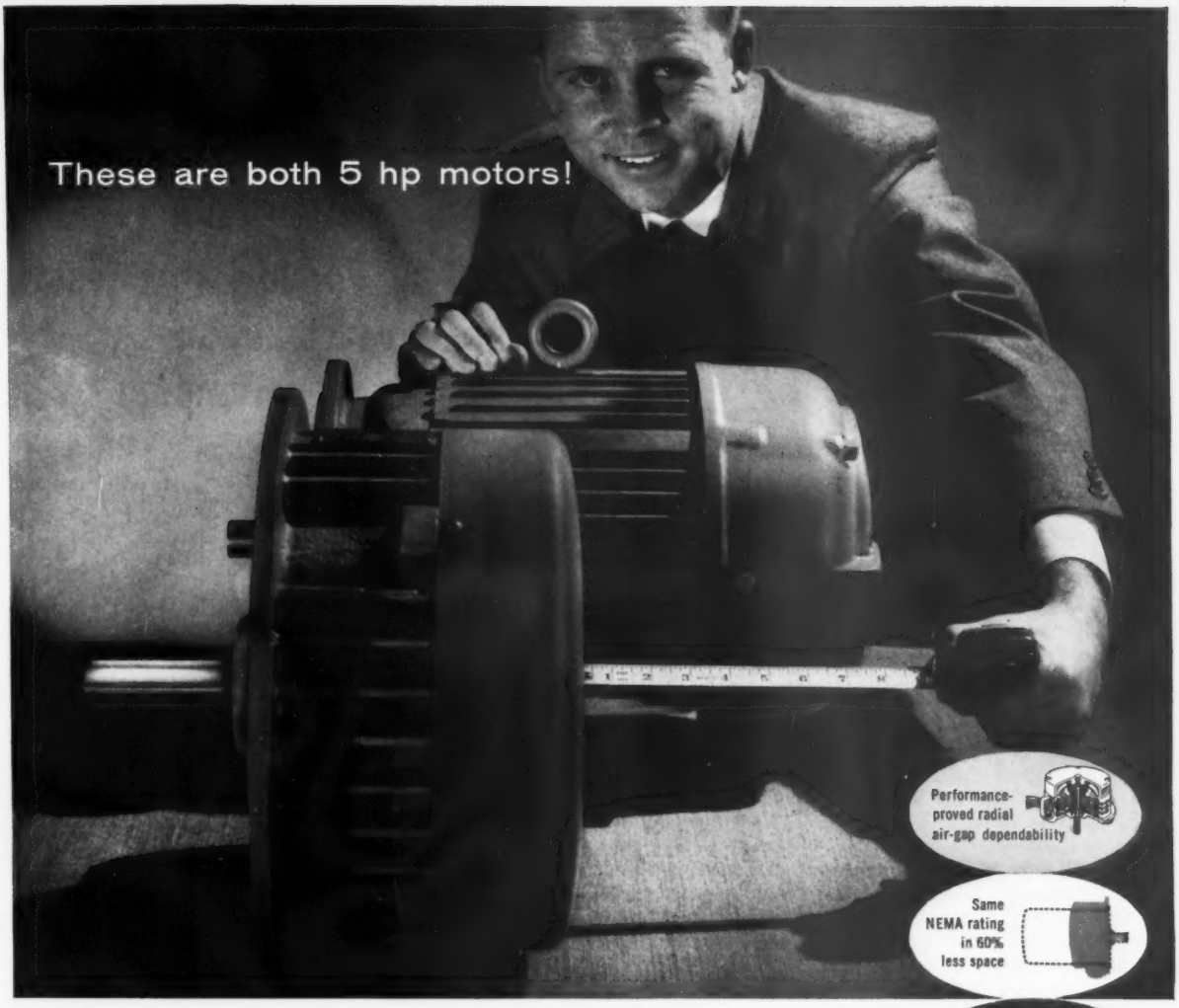
You've got 24-hour lead time to stop shaft pit corrosion

PIT CORROSION of a carbon steel shaft can take place in 24 hours—even in a climate like Arizona's.

case history 85

At the Reynolds Metal Co. in Phoenix, where a variety of solid and hollow extrusions in aluminum alloy are produced, some type of resurfacing was needed to maintain fits where the shaft of extrusion presses enter stuffing boxes.

Automatic welding and machining were combined on a Simmons heavy-duty lathe with 48-in. swing and a 40-



60% shorter– but with radial air-gap design!

New Louis Allis Pancake Motor preserves all the advantages of conventional motor construction

The new Louis Allis Pancake Motor is your solution to trouble-free power in any space-cramped motor application.

The Pancake is a remarkably short flange-mounted motor — up to 60% shorter and 33% lighter than standard motors of the same rating! And it is built in *conventional* radial air-gap design!

It's done by an ingenious forming process which literally compresses the end coils of a conventional radial air-gap motor into an exceptionally short length. The result is a compact, light motor ideally suited for horizontal or vertical mounting on machine tools, roof ventilating fans, or *any* close-quarter installation where space is a critical design factor.

What's more, this is achieved without sacrificing a single desirable characteristic: the stator still contains the same iron and copper as standard Louis Allis motors . . . standard NEMA service factor is maintained . . . high insulative values are retained by using proved Louis Allis varnishes and new insulating techniques . . . over-sized pre-lubricated bearings are used to guarantee long bearing life . . . and the entire motor is enclosed in an industrial-type cast-iron housing designed to shrug off abuse!

SM-101

The housing and flange are cast in one piece: this permits extra-accurate internal machining which extends bearing life and reduces noise levels to a new low.

Investigate the Pancake Motor through your local Louis Allis District Office. Sized from 1 to 15 hp, at 1800, 1200, and 900 rpm, in open drip-proof and enclosed non-ventilated or fan-cooled enclosures. Write for Bulletins 2100 and 2150 to the Louis Allis Co., 438 E. Stewart St., Milwaukee 1, Wis.

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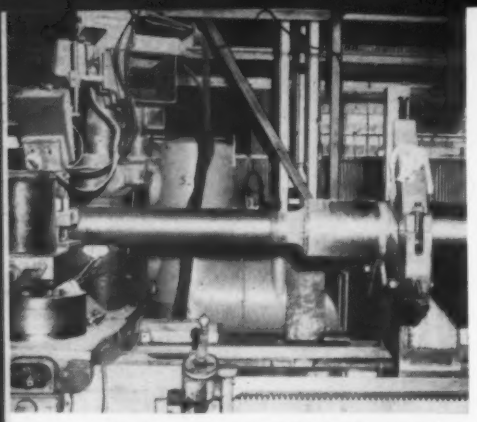


Stepped diameter 22-ft. shaft mounted in heavy-duty lathe for automatic welding of a stainless steel surface over corroded areas. Drill press mounted on the cross carriage to support welding head.

ft. bed. For the welding, a Lincoln Electric automatic LAF submerged arc head was mounted on the column of an old drill press which, in turn, is set on the lathe cross carriage. The latter is traversed by means of a continuous feed screw with either a No. 6 or No. 5 thread, depending upon shaft diameter.

Areas to be surfaced vary from as little as 4 in. up to 10 ft. along the shaft, easily accommodated by the wide side swing. Vertical adjustment of the head is through a rack and pinion on the drill press column.

Electrode wire is ⅛-in. diameter 18-8 stainless steel, fed from a spool atop the drill press column. Two hoppers and nozzles supply a stream of agglomerated flux to envelop the arc, being directed from both sides of the electrode point to avoid having the arc pop through. Flux is Lincoln Electric ST-100, a special composition for use with 18-8 electrode wire, containing sufficient ferrochrome to compensate for chromium lost from the wire during melting. Welding current is supplied by a 900 amp. generator, although most settings are confined to the 280-330 amp. range.

With arc travel speeds of 32-40 in. per min., fast for this sort of work, it is still necessary to cut the lathe speed down far below conventional levels, perhaps only 1 or 2 rpm. at best. This is a critical factor and is met by the combination of a synchronous gearhead motor and a U. S. Vari-drive (V-belts and adjustable sheaves.)

The surfaced shafts are machined in the same lathe, after removing the drill press and welding head from the cross carriage and replacing them with suitable tooling. Straightening is the next step, if the shaft shows an out-of-line condition. No two shafts appear to react in the same way, controlling factors being the degree of locked-in stresses and their relief through the heat of the welding cycle, speed of welding, current settings, and the prior service to which the shaft has been subjected. Straightening is done in a lathe set-up.

Final operation is grinding the stainless steel surface to a mirror finish, whereupon the shaft can be returned to the extrusion press. Allison Engineering has finished dozens of shafts in this way and all have performed without any rework or any further surface deterioration.

Hard worker handles 20 carloads of wood chips a day — no strain

ONE HARD WORKER at the Western Kraft plant at Albany, Ore., is handling 20 carloads of wood chips a day and replacing two dozer-equipped crawler tractors which had been having trouble keeping up with the job.

case history 86

The industrious newcomer is a Scoopmobile, which works atop a pile of wood chips more than 100 ft. high and covering three acres.

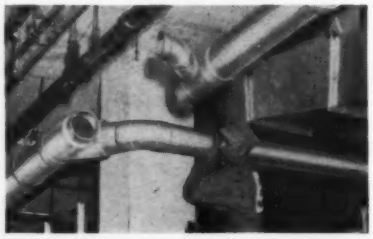
Handling 250 cubic feet of wood chips with every swipe of its bucket loader, the machine easily copes with the job of putting 17 carloads of chips daily onto a conveyor belt that feeds the paper machines. And it stacks an additional three carloads on the giant reserve pile, so that despite high consumption, the plant now has a three month reserve supply of chips.

The Scoopmobile's two-axle oscillation enables the machine to keep all four wheels on the pile, giving it the power it needs to scoop such large quantities.

With every swipe of its bucket, this Scoopmobile gulps 250 cu. ft. of wood chips—with all four wheels firmly on the pile.

Manufactured by Mixermobile Manufacturers, Inc., Portland, the Scoopmobile is powered by a 175-hp. engine, has a four-wheel planetary drive and four-wheel steering. Other features include non-rigid articulated frame, power steering, torque converter and power-shift transmission.

For low cost, easy installation try copper piping



Copper tube plumbing is easy to handle. Here, one maintenance man assembles a 6-in. drainage line into a reducing branch from an 8-in. line.

COPPER costs less to buy and install —compared with some other pipe— which is why copper is being used not only in the construction of Western homes, but in plants, too.

case history 87

Since the development, about 25 years ago, of solder-joint wrought copper and cast brass fittings for use with relatively light-wall copper tube, the change from heavy, ferrous pipe requiring threaded or caulked connections has been continually increasing.

Currently, the fastest growing single application of copper plumbing is for sanitary drainage lines. Here again, the use started in residential work but now it is not an uncommon sight to see copper drainage lines up to 8 in. and even larger being installed in industrial, commercial or institutional buildings.

Watch a copper tube job being installed—first of all, it is easy to handle —for instance a 20-ft. length of 4-in. Type DWV weighs only 57 lb. Long lengths can be readily lifted into position (see photo). The light weight also means that sections can be preassembled on the floor or in the contractor's shop and brought to the job ready to be put in place. Long lengths mean fewer joints—a big time saver. Copper tube lines and fitting connections take much less space, save headroom and eliminate the need for wide plumbing wall partitions. Connections

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Simple flick of lever (left hand) controls forward-reverse. No sharp shifting surge to disturb load. Right hand is free to control hoist lever.

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Torque Converter automatically adjusts power output to load. Smooth application of power eliminates jerky truck movement common to many other automatic transmissions.

Ask your Hyster dealer for a demonstration, or write Hyster Co., P.O. Box 847, Danville, Ill., for descriptive brochure

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. . . for more details, circle No. 33 on Reader Service Postcard

using solder-joint fittings are made much faster than the threading or caulking required in heavy, ferrous pipe.

All of these advantages for copper plumbing are substantially reflected in the installation cost. Yet, because of the non-rusting and corrosion-resistant properties of copper and the smooth interior surfaces of copper tubes, the plumbing installation is superior.

Dies live longer when finished in dry honer machine

case history 88

PROBLEM—to maintain dies for use in automatic punch presses that would run commercial steel stock varying in thickness plus or minus .002 in. without scratching, galling or heat damaging parts.

The National Seal Division of Federal-Mogul-Bower Bearings, Inc., of Redwood City, Calif., manufacturer of highly competitive automotive parts, began an intensive search for the solution.

It came by discovering the value of imparting a satin or matte finish to all dies with a self-contained dry honer machine, which uses blasting powder for surface lubrication, so avoiding the constant dampness attached to liquid lubricants.

Results were immediate.

Die life in the presses was more than doubled. In one recorded test, a die which formerly ran from 200 to 400 parts produced 8,000 parts after dry honing.

The dry honer machine, called Vacu-Blast and manufactured by Vacu-Blast Co., Inc., of Belmont, Calif., has allowed the company to make a substantial reduction in its die parts inventory.

"Roughing up" die surfaces is accomplished on a Vacu-Blast dry honer, a self-contained machine with a dust-free feature that permits operation at the most functional point in a tool-and-die shop or production line.

Redesigned lighting system ups pen production 28%

General Electric Warm White Slimline lamps brighten picture at "Paper Mate" plant.

case history 89

PRODUCTION WAS UPPED by 28% with a redesigned lighting system adopted by the Frawley Corporation, manufacturer of "Paper Mate" pens, in their Culver City, Calif., plant.

Faced with having machinists take parts over to the window for closer inspection, the company installed a modern "upward light" fluorescent system, boosting the level from a gloomy 18 to 40 foot-candle rating to an easy on the eye 150-foot candle.

Results—workers' morale has improved, production has increased and the new lighting is paying for itself.

Using continuous rows of fluorescent fixtures equipped with G-E 96-T12 Warm White Slimline lamps, manufactured by General Electric Corp., light diffused over the entire working area, eliminating strong contrasts between work in process and the surrounding area.

Formerly, the shop had been lit by fixtures placed directly over machines. Now, the company notes, with the new lighting system there has been a marked increase in overall production with special emphasis on the amount of increase from its older workers.

Building successful business starts from the floor—up

case history 90

SUCCESSFUL BUSINESSES are built from the bottom up—and a good floor is an essential foundation on which to build.

Back in the early thirties, the Pacific Paint and Varnish Company, Berkeley, Calif., had 30,000 sq. ft. of its three manufacturing floor areas topped with the tough granolithic concrete floor topping.

And they are still hard and in a serviceable condition.

When the plant was enlarged in 1951, a conventional concrete floor was laid in the new area. Now it must be replaced because it's worn out.

Rubber-tired and steel-wheeled fork trucks traverse the area hundreds of times a day carrying an

average load of a ton. In past years the ordinary concrete floor has deteriorated to the point where cracking, pitting and crumbling of the surface have created serious traffic problems.

The 10,000-sq. ft. floor area is now being replaced by the Kalman Floor Co., which laid the original floor back in the 30's in sections up to 2,000 sq. ft. at a time. The work is being done after regular working hours in order to eliminate dust that could contaminate paint products.

After the old floor has been removed down to the base slab, the granolithic topping, which is uniformly dense wearing course about ¾ in. thick, will be installed.

The topping is put down by means of an absorption process, which closely controls the water-cement ratio and achieves a tight bond between topping and underslab. It also insures even distribution of the hard granitic aggregate throughout the mass, resulting in uniform smoothness and very high density.

To make cement—you've got to weigh ingredients carefully

case history 91

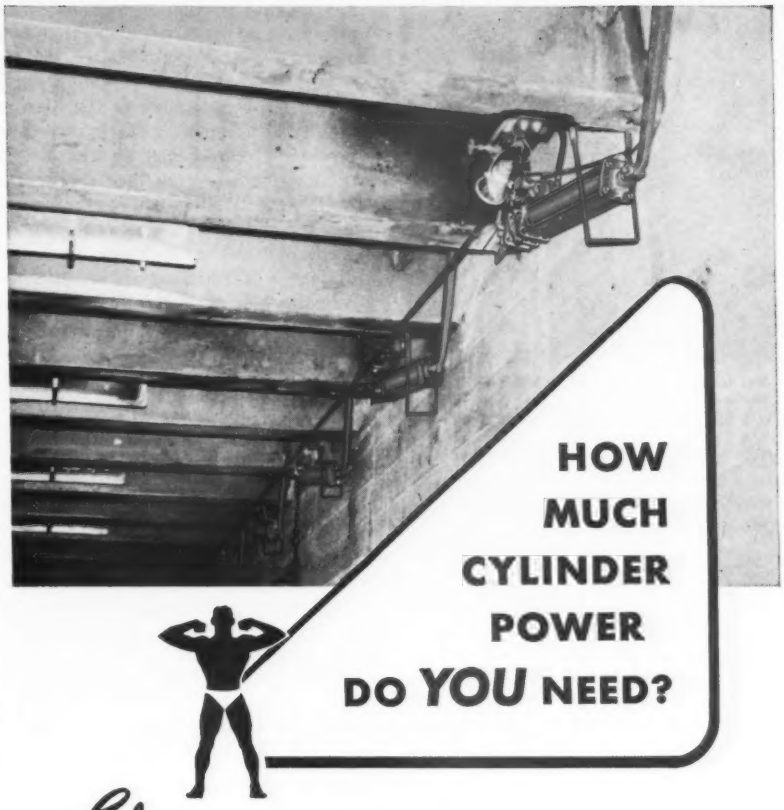
HOW IS CEMENT MADE?

Well, at the Permanente Cement Co., in Cushenbury, Calif., there are four basic steps: quarrying, grinding, blending and burning—with careful weight control at every stage.

The process begins in the limestone quarry where rotary drills drive a series of powder holes along the top of the quarry face. These are filled with explosives and the blast loosens thousands of tons of rock at one time. A power shovel scoops up the loose material, loading it into rock buggies for transportation to the primary crusher at the quarry site, where it is reduced to 7-in. minus size.

The crushed rock is fed to a conveyor belt for delivery to the secondary crusher which reduces it to a 3½-in. minus size. It is on this belt that the limestone is first weighed by a conveyor belt scale and the weight recorded on a Bristol "Dynamaster" electronic, self-balancing potentiometer.

This and two other conveyor belt scales on the production line are fur-



Ledeen CYLINDERS Operate Coarse Ore Bin Chute Gates at Copper Mine

These 4" dia., air-operated Ledeen Cylinders—remote-controlled by Ledeen Valves—speed the loading of ore trains. They combine the advantages of automatic control with the known dependability of Ledeen Cylinders. Because of their rugged construction, these cylinders will deliver years of trouble-free service.

Standard cylinders available from stock in 1½" through 12" bores. Special cylinders up to 20". These cylinders offer a wide range of capacities to meet your power requirements.

HOW MUCH CYLINDER POWER DO YOU NEED?

Ledeen CYLINDER CAPACITIES

CAPACITY OF CYLINDERS FOR VARIOUS PRESSURES, LBS. PER SQUARE INCH

Dia. of Cylinder	50	60	75	85	90	100	150	200	300	400	500	600	750	1000	1500	2000	3000
1½"	65	78	97	105	117	131	195	262	810	1,080	1,350	1,620	2,020	2,700	4,050	5,400	8,100
2"	135	162	189	216	243	270	405	540									
3"	314	378	440	502	565	628	942	1,256	1,884	2,512	3,140	3,828	4,710	6,280	9,410	12,560	18,820
4"	567	680	793	907	1,021	1,134	1,701	2,268	3,402	4,536	5,670	6,804	8,505	11,340	16,740	22,680	34,020
5"	1,035	1,390	1,855	2,121	2,386	2,651	3,975	5,302	7,953	10,604	13,256	15,906	19,880	26,510	39,765	53,020	79,530
6"	2,356	2,827	2,897	3,769	4,590	4,712	7,068	9,424	14,136	18,848	23,560	28,270	35,340	47,120	70,680	94,240	141,136
10"	3,681	4,418	5,154	5,890	6,627	7,363	11,045	14,726	22,089	29,452	36,810	44,178	55,225	73,630	110,445	147,268	220,890
12"	5,309	6,360	7,420	8,480	9,540	10,602	15,904	21,205	31,809	42,413	53,020	63,618	79,520	106,030	159,045	212,060	318,090

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Send for this cylinder capacity chart. It will help you determine the size Ledeen Cylinder you need to meet your power requirements.

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Just touch the printomatic on this Fairbanks, Morse & Co., scale, and you have a permanent weight record.

nished with remote recorders located in the plant laboratory which give a permanent record of tonnage and flow of all material on the belts.

Clay rock is mined in the same way and deposited in storage piles for use in cement production. These stock piles have a capacity of more than two months required rock.

Drawn from the piles through gravity-fed hoppers located at the bottom of the pits, the clay is carried by conveyor to the fine crusher where it is again weighed, and the weight recorded electronically. The information is relayed to the laboratory, enabling men there to know precisely the tonnage and flow rate of clay passing over the belt at this point. The fine crusher reduces the mineral size to ½ in. before it is transferred to the mill for raw grinding.

And there's much more to it. In the grinding process, limestone and clay are ground finer, screened, blended and mixed with water into a slurry.

But one thing is common to each process. Weight is uniformly controlled at every stage by scales manufactured by Fairbanks, Morse & Co.

For a quick, safe lifting job try overhead automatic tongs

AUTOMATIC TONGS suspended from an overhead crane are handling steel coils more quickly and with greater safety at the American Metal Products Co., Inc., Los Angeles—and warehouse space has really been stretched.

case history 92

A manufacturer of sheet metal products, this firm uses large quantities of galvanized sheet steel, received in coils bound with steel strapping.

Formerly, these were carried to the storage area by fork lift trucks, requiring spacer blocks between each coil to allow the forks of the truck to get under them. And blocks were positioned by hand, creating a great safety hazard.

Now, tongs are used to unload the incoming coils, transport them to the storage area and stack them. When steel is required for processing, the tongs are used to pick up the coils in the storage area and place them on industrial trucks which carry them to the manufacturing departments.

The tongs are lowered over a coil with their jaws locked open, one jaw in the space at the center of the coil and the other on the outside. When the tongs are raised, the jaws close automatically, holding the coil firmly and safely.

However, when the coil reaches its destination, and again rests on a firm surface, it is necessary to lower the tongs only a few additional inches to lock their jaws open, releasing the load.

Designed for loads up to 5,000 lb., the tongs, manufactured by the Heppenstall Co., New Brighton, Pa., have a maximum opening of 12 in. and a minimum of ½ in. They do not damage the coils or the edges of the sheet metal.

Improved lifting operations at the warehouse of the American Metal Products Co., Inc. Heppenstall tongs have a capacity of 5,000 lb.

Resilient asbestos lives 5 times longer in packaging steel

STEEL PLANTS in the West are getting five times the service life than they got from conventional packings.

case history 93

Their secret is the use of Champac Asbestos-Teflon packing to seal against organic chemicals, solvents, liquid caustic soda, weak acids, and base chemicals. Even on water pumps, Champac stands up longer than conventional graphited packings.

ASSETS . . . does not dirty hands, makes packing of troublesome applications easy, eliminates variety of styles of packing to fit various services.

Johns-Manville Champac is strong resilient asbestos thoroughly treated with chemically inert Teflon to about 30% saturation. This packing has the sealing and heat resistant qualities of asbestos plus the low friction and added protection of Teflon against corrosive attack.

It's in the box—redesigning halves handling costs

IT'S IN THE BOX. The Fruehauf Trailer Co. is halving the cost of material handling by using redesigned wooden boxes as containers for shipping castings and other suitable parts and materials to the different plants operated by this company.

case history 94

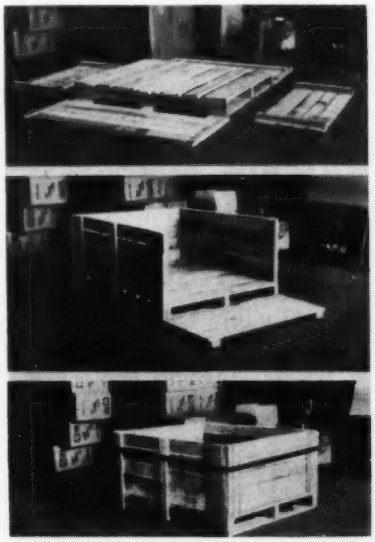
It was found that types of boxes used previously cost $7.26 a box and required four bands costing another 60 cents. Time study showed it required about 12 min. to set up each of these boxes.

The new box costs $3.04 each and can be set up in three minutes, making a saving of $4.22 per unit and three-quarters the time required for previous boxes. They also require only one band at a cost of 24 cents instead of four at 60 cents.

Experience shows that these boxes

are good for an average of about 12 trips before destruction, and they can easily be set up by one man. A nail is driven on each side of the box causing it to become rigidly erect. The ends are then dropped into place and one band completely wrapped around the circumference.

Designed by *F. S. Sullivan*, in charge of material handling for the Fruehauf Trailer Company, the box



Steps in the assembly of the Frubox, designed by F. S. Sullivan, in charge of material handling for Fruehauf Trailer Co.

is 48 x 40 x 20 in. deep, and they are made of ¾-in. re-sawed lumber with 2 x 4-in. runners.

In a typical use they transmit underconstructions from vendors to various Fruehauf plants and they replace the wire-bound boxes which are supplied by this source to most other trailer manufacturers, with a saving of $3.20 per unit—and the box can be easily knocked flat for return shipping.

"Hot" rocket fuel comes clean in portable shower

case history 95

AMERICAN MISSILE men who are accidentally contaminated with liquid rocket fuel now have a portable shower which quickly cleanses them.

Called "Rocket Propellant Personnel Neutralizers," the unit was made for the U. S. Army by Lofstrand Co., Rockville, Md.

Designed for use at tactical missile sites, units are sent into the field with the men who set up, fuel and launch missiles—but could also give protection for workmen in the chemical industry, munitions, oil fields and plastic industry, as well as industries using radio-active materials.

The shower has a 100-gal. water tank with two air or nitrogen cylinders. When the shower treadle is pressed, air pressure—45 lb. per sq. in.—forces water out the spray head.

Mounted on skids, the entire unit weighs 570 lb., is 3 ft. wide, 4½ ft. long and 7½ ft. high, and can be folded for moving.

And the water tank is so well insulated that four truck flares will keep the water at body temperature when the thermometer reads 25 deg. below zero.

An electrical immersion heating unit is available in case the shower is to be used where open flames would be dangerous. To protect workmen from scalding by overheated water, a fusible type drain plug will melt out and deactivate the shower when the temperature reaches 135 deg. Other safety features: a pressure relief valve, and vent holes in the side of the fill

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cap to warn audibly of pressure within the tank when the cap is loosened.

And Reynolds Metals manufactures the lightweight aluminum from which the units are fabricated.

New method extracts odor, bitterness from dried pepper

DRIED PEPPER sometimes has a bitter taste. You've probably tasted it and wondered if the pepper was burned during processing.

case history 96

Well, Ventura Farms Frozen Foods, Inc., at Oxnard, Calif., has perfected an extract method which does away with both scorched odor and bitter taste.

The process produces a dark, ruby red oil which is odorless and free from sludge-forming impurities. This oil contains carotenoids and other color principles desirable for use in oleomargarine, meat products and dressings.

Waxes, sugars and acids are eliminated, allowing much faster extraction of a greatly reduced weight.

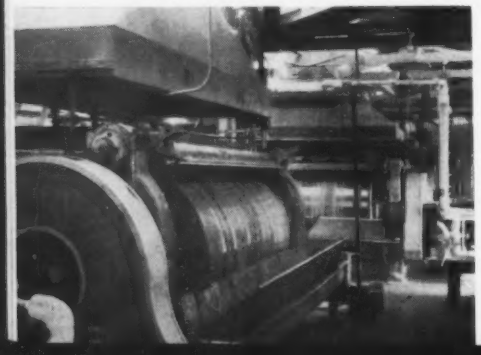
Here's how it's done.

Peppers are washed, seeded and pureed, then mixed with water and screened to remove pulp. The broken peppers pass into perforated reels to complete seed elimination without use of water thus preventing loss of color.

The juice is accumulated in 5,000-gal. batches before coagulating the pectin and proteins to produce a curd containing all the color bodies present. This curd is allowed to settle before decanting to give a slurry which is then filtered. The resulting cake is rediluted to a heavy cream and fed to a drum drier, which produces thin flakes containing 45% of 40,000 unit color.

And out of it all comes—yes—Oleoresin Paprika, from paprikas the way only Californians can grow them.

Drum driers on which reslurried cake from filter press is dried to give high color flakes.



Fork lift can get under a box on any side. If interior warehouse dimensions permit, crates may be stacked three high.

Storage can jump from square ft. to cubic ft. basis

STORAGE COMPANIES were being crushed in a vise of soaring rents and higher labor costs until a Western crate and pallet builder came up with a solution.

case history 97

It consisted of mass-producing fir plywood crates for storage. The idea rests on taking the storage business off a square-foot basis and putting it on a cubic-foot basis.

Instead of stacking materials within a marked area on a warehouse floor, firms using the crates are storing 300% or more goods in the same space by using crates.

Result—man-hours in material handling have been reduced by 60%; no pilfering; contents remain dust-free; fire hazards are reduced, and insurance rates go down.

Cases in point . . . in Sacramento, Calif., Lyon Van & Storage was using two old car barns for storage. Now, with goods stored in crates, one of the car barns has a "for rent" sign up.

And Stan's Vans in Oakland has tripled the amount of household goods it can store.

When a customer has belongings to be moved, the pre-fabricated, knock-down crates are hauled to the loading site on a flat-bed. Furnishings are stacked on the crate floor which remains on the trailer. After loading the crate, sides and top are fastened with special wire clips.

Crates are custom built to fit particular warehouse facilities. Some crates have hinged doors. This facilitates partial unloading when crates are temporarily stored.

Sizes range from 5 x 7 x 7 to 8 x 8 x 12 "Sea Vans," and the manufacturing company, Acme Pallet Co. of Oakland, custom builds a variety of other sizes.

Wire zig-zags to give you a better rest

DID YOU KNOW you spend almost one-quarter of your lifetime in bed and another two-thirds in a sitting position?

case history 98

No wonder the mattress and upholstery businesses are important—and in Redwood City, Calif., one industry is engaged in producing a curious zig-zag device, designed solely to make you more comfortable.

This product is a crescent-shaped, sinuous spring which looks like the pattern left by a sidewinder rattlesnake, and is made of high tensile steel formed and tempered into serpentine strands of circular shape to be used by upholstery manufacturers.

Uncoiled and anchored at the ends of a frame, they form a shallow arc which gives the contour to the cushioned seat. In this position the springs have an accordion-like resiliency and while deflecting any weight set on them, they are constantly striving to regain their original shape.

No-Sag products are made of Bethlehem Pacific Coast Steel Corp. Silver Star and special analysis wires. Machine-forming the many intricate patterns of loops, zig-zag and coils puts this wire to its severest test, for it must perform uniformly in each bending operation. The spring is made on a machine with an indexing head and two forming arms. The wire is first formed into a zig-zag crescent and is then bent back on itself 180 deg. in three stages. In its final form the spring is crescent-shaped with one end formed into a "Y." The upper portion of the "Y" is free and floating, forming the upper lip on the forward edge

Indexing head and two forming arms on this machine form the sinuous No-Sag coil from a reel of Bethlehem Pacific 10½ gage Silver Star upholstery wire.

of the seat, forming what is known as "the soft edge" of a seat.

Coils for box springs and mattresses are turned out according to the specifications of the mattress manufacturer. Coils are made and assembled later in a lacing machine. Long helical coils of wire are used to join them together and gages run from 15½ to 13, the heavier gage being used for harder mattresses.

After forming, both the mattress coils and the V-arced springs are tempered at exacting temperatures to relieve the forming stresses and preserve the resilience for comfort of the user.

For a satin finish and lotsa luster, try this machine

case history 99

EVER BOUGHT a piece of furniture because you liked the satin finish—then got it home, looked at it from a low angle, and found the satin looks glossy?

Well, there's a satin finishing machine that has done away with such disappointments.

Originally designed to reduce the high gloss on decorative laminates to a uniform satin luster, the machine will produce a uniform finish consistently throughout a production run. It is especially good at producing more natural finish on wood patterns and blending imperfections into an overall satin finish.

Here's how it works.

Glossy panels are fed into the machine through feed rolls and a solution of pumice slurry is pumped onto the panel just before it passes under the finishing brushes.

The pumice solution is then wiped off and drained back into a recirculating tank where it can be used over and over again. A washoff station and scrub rinse follow, where any residual

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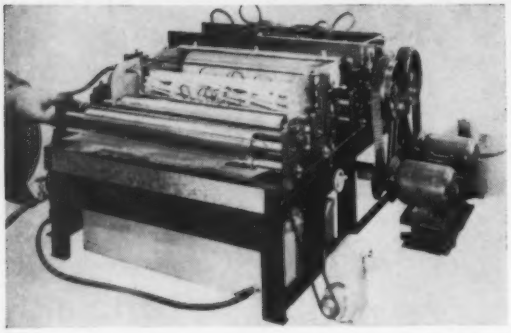


Fuller Brush Co. decorative laminate satin finisher reduces the glossy finish on laminated panels to a uniform satin lustre. It replaces costly and easily marred satin finished caul plates or press pans.

pumice is washed off. The panel then passes through an air squeegee where the washoff water is wiped off as the panel comes out of the machine.

A good cleaning job can also be obtained on soft metal surfaces such as copper, aluminum, zinc and other types of plastic film.

The advantages of using this machine manufactured by the Fuller Brush Co. of Hartford, Conn., are: only one type of press plate is required; it gives consistent degree of luster over long runs; glossy inventory can be built up, then satin finished to order, and satinizing can be the last operation before packing—reducing risk of marring finish.

Blending art and science for controlled ventilation

CONTROLLED VENTILATION is more than a science—it's an art. Both were delicately blended when air temperature 1,500 ft. underground was raised from as low as minus 20 deg. to a workable 40 deg. at Intermountain Chemical Company's soda ash mine near Green River, Wyo.

case history 100

Eight space heaters, with fan sections removed, were installed in a louvered fan house. Cold air driven by two fans with a combined pull of 300,000 cu. ft. of air per min. passes over an airfoil-designed stainless steel combustion chamber and two banks of aluminized steel secondary heat transfer tubes in each unit.

Heated air, moving through the fans, is propelled through an insulated air duct to the shaft headframe—a distance of 50 ft. Convection is created by warm air rising out of exhaust shafts and a cool current of fresh air is sucked through the entire mine.

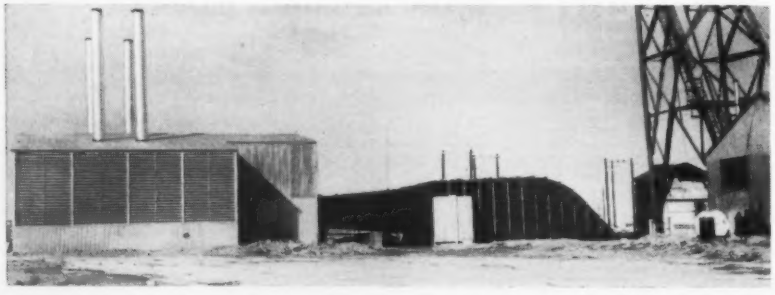
Temperature must be kept at a minimum of 40 deg. to prevent pipe lines from freezing in winter weather.

Furnaces in the eight Dravco Counterflo space heaters are paired into four integrated units, with one furnace of each pair lined horizontally on top of the other. Burners of each dual furnace assembly are independently operated by recording temperature controls installed in the air ducts to the shaft.

This allows separate units to temper air while unheated drafts pass through idle furnaces.

Exhaust gases from Dravco heaters are vented through four stacks—one for each furnace unit, to blend art and science for controlled ventilation.

Dravco space heaters raise underground temperatures to a workable 40 deg. at Intermountain Chemical Co. mine.



Stamp welding saves as much as 75% in welding costs

STRAP WELDING can save as much as 75% in the cost of making a weld.

One of the world's top leaders in the manufacture of super-heavy equipment, R. G. LeTourneau, Inc., at Longview, Texas, has found that such welding has consistently offered an infinitely wider margin of safety—at the same time costing far less in time and materials.

case history 101

Marking his 50th year of pioneering in the science of welding, *Robert G. LeTourneau* said this month that objections to the system cannot go beyond the accusation that such extra welds "do not look good." He added, however, that "looks are a matter of education of the eyes—and my eyes like the looks of strap welds because I've seen so many strap welds really take the gaff."

Straps welded to both sides of jointed tubular truss add bonus safety factor in construction of spud legs for drilling platform at R. G. LeTourneau, Inc., plant.

He noted that his firm's heavy equipment (from giant log-handling machines to 4,000-ton mobile offshore platforms,) has been constantly subjected to soaring degrees of brutal punishment, with practically no structural failure where strap welding was used.

"When you just butt two pieces of metal together you can't get a weld that is more than 100% perfect, and you might get less," LeTourneau warned, adding that through his method of strap welding bars across every critical weld, the firm had been able to offer an extra 50% safety margin. A half-inch weld is at least one-fourth as strong as a two-inch

weld, but it has only one-sixteenth as much metal in it and it goes on sixteen times as fast as a two-inch weld.

"So," LeTourneau said, "in butt welding two pieces of two-inch plate, it would be cheaper to weld a half-inch in from the top side and another half-inch from the bottom side and then simply put on a few straps to make do for the center half."

One of the problems in attaining 100% strength through conventional welds is, if one is attempting to join heat-treated metals which have 120,000 psi. tensile strength. Strap welding provides the only answer if the weld is not to be broken.

Hydraulic motor makes this the torque of the West

IT'S THE "TORQUE" of the West. By replacing an electric drive with a hydraulic motor, Boeing Airplane Co. Transport Division equipment engineers have converted a standard Thompson Model F Grinder into a variable-speed grinder for precision use in experiments. And it's believed to be the first such conversion West of the Mississippi.

case history 102

The problem was to develop a machine that would produce the same torque at all speeds for grinding such advanced metals as titanium, and to determine the optimum speeds at which such grinding should be done.

Conversion was a simple matter. The end-bell and motor of the Thompson grinder's one and one-half horsepower electric motor were removed. A new end-bell was made to support the Vickers MF 2003-23-12 hydraulic motor which was coupled to the sprindle of the machine.

A Vickers D-124-10 hydraulic drive powered by a 10-hp. electric motor provides power for the hydraulic motor. Hydraulic pump, tank, control valves and electric motor are at one end of the Thompson grinder.

The new arrangement provides the grinder with 120-in. lb. of torque at 1,000 psi. Maximum operating speed of the grinder is 3,600 rpm., although it is possible to reach an absolute top speed of 4,400 rpm.

Using an electric motor, it would

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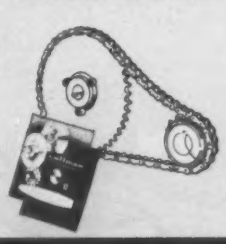

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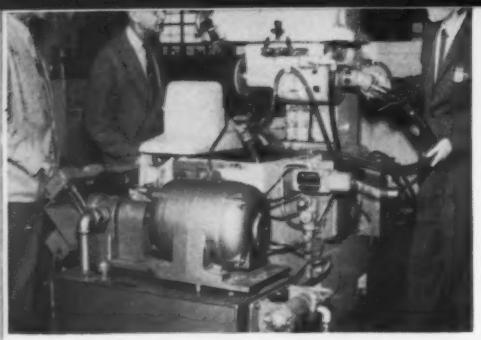


Boeing Airplane Co. engineers inspect the Thompson Model F grinder after conversion into variable-speed grinder by using Vickers hydraulic motor.

have been virtually impossible to produce precisely the same torque at different speeds.

Low cost building frees valuable production space

THE MORE business you get, the more room you need to keep up with demands. And the Trailorboat Engineering Co., San Rafael, Calif., was no exception.

As the marine supply business grew, the need for more space became critical; space which a straight sidewall, clear span building with floor-to-ceiling would provide.

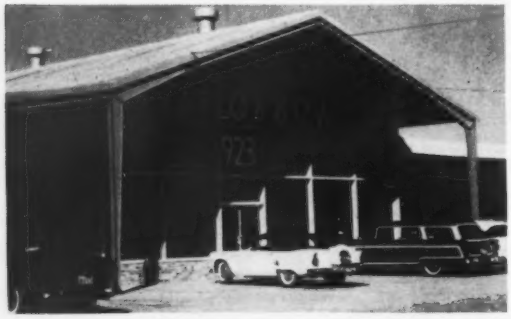
The expansion problem was solved with the construction of a new 50 x 160 x 14-ft. Butler rigid frame steel building to house their shop, sales and office spaces. With this, they were able to lay out their plant manufacturing processes and schedule material flow to result in a more efficient operation, lower costs and higher productivity.

Further expansion was made with the addition of an 80 x 160 x 12-ft. Butler rigid frame steel building entirely separate from the original building. At the same time, a 60-ft. section of the original building was detached and moved to become a separate building for other fabricating purposes.

To the 50 x 100-ft. remaining section of the original building was added a 25-ft. lean-to and the structure was remodeled to become the sales office.

Continued business growth necessitated still another expansion, this one being a Butler 100 x 100 x 14 ft. added to the 60-ft. section previously removed from the original building.

Because of the pre-engineered features of the building, engineering costs were lowered considerably. And it was possible to add to plant facilities in a way which enables returning profits to come sooner.



New Butler rigid frame steel building solves expansion problem for Trailorboat Engineering Co. Building houses shop, sales and office areas . freeing valuable production space.

Roger H. Kendall,
President
Neptuna Corporation,
Glendale, Calif.
Manufacturer, "Neptuna" land-and-water cruiser

"Seagoing Trailer" Launched by Telephone Selling

"We do all our selling by telephone," says Mr. Kendall. "Our national magazine ads carry a 'Call Collect' message. Results? Half a million dollars in sales in just two months . . . from 112 out-of-town calls averaging $1.85 in cost. Personal selling by telephone is the only low-cost way to quickly put a new product on the map!"

Merchandising a product nationally and speeding up collections are just two of many ways in which the telephone is helping firms like Mr. Kendall's become leaders in their field. We'd like to suggest other ways the telephone can help you bring in new orders, cut costs, widen sales coverage. Our Long Distance specialists are at your service. Just call our business office.

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40 BEST ABRASIVES MANUALS

Dear Joe:

WHATTAYA mean, you already know all about abrasives? That was years ago, man. And like the VIP's say: "There have been significant developments in the abrasive field over the past two years."

Take wheels, for instance—bigger and smaller with plenty more uses and made with entirely new bonding materials. And perfected with electronics, yet. Electronic Formulation, it's called, and it's a way of calculating weights of abrasive grains and bonding materials so your wheel will be AC-CUR-ATE! There are lots of new uses for old things too: In blast cleaning steel shot descales sheet and strip these days. And then there've been improvements in existing abrasives too numerous for yours truly to list.

So look below at the 40 best and latest manuals on abrasives—some of them new this year—and pick out the ones you want. I'll betcha you'll be circling a lot of numbers on page 67 because, take it from me, you can really use this stuff.

Abrasively yours,

Bill

Grinding wheel specs for tool, die steels

This handsome 25-page reference book condenses grinding wheel specifications for tool and die steels to picture and chart form in four divisions, all explained as the book opens. It briefs the electronic formulation process for calculating important weights with maximum precision. *Bay State Abrasive Products Co.*

. . . for your copy, circle No. 251

85 mounted wheels shown life size

Actual size drawings of more than 85 mounted abrasive wheels in all sizes and shapes with dimensions indicated are classified in this eight-pager, punched for notebooks. The recently adopted standard suffix designations for mandrel projections and diameters are also presented. *Simonds Abrasive Co.*

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Medley of nonferrous metal finishing tools

Before and after pictures of aluminum, brass, bronze and magnesium products in this eight-page leaflet point out the advantages of various belts and discs for removing nibs, risers, burrs and flashings. The picture book also features abrasives for patterns, molds and dies, pressure sensitive tapes, a platen sander and portable disc grinder. *Minnesota Mining & Mfg. Co.*

. . . for your copy, circle No. 253

These abrasives are at least 99.9% pure

These fact sheets spell out the qualities and properties of "Linde" alumina abrasives, offered in three grades and in three micron sizes. Linde alumina abrasives are white powders at least 99.9% pure. They are highly resistant to attacks by common acids. The fact sheets suggest uses in chemical, lighting, ceramics, metal fabrication, metallurgy, etc. Charts, diagrams and photos round out the picture. *Linde Company, Division of Union Carbide Corp.*

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Briefs on coated paper, cloth, wheels

A four-page folder on the Jewel line of coated abrasives for just about every need presents seven types in brief paragraphs accompanied by comprehensive data in chart form. Grinding discs are treated in detail in a second four-page pocket-sized leaflet Both are illustrated. *Abrasive Products, Inc.*

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Contour sanding wheel for the novice

Sand-O-Flex is a brush-backed contour sander which is as easily used by the novice as the skilled craftsman, according to this single-page notebook insert. The sheet pictures the wheel in action and explains why it is so simple to use. *Merit Products, Inc.*

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How to select the right abrasive

Shall it be steel, malleable and chilled iron shot and grit, a soft abrasive, aluminum oxide grit or a special silica abrasive? The 12-page "Blast Cleaning Abrasives" will answer the question, at the same time stressing the importance of selection of the right type for a particular application. *Pangborn Corp.*

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Brushes for use with abrasives

Here's a 16-page illustrated article on the brushes that can be used with abrasives, brushing methods and machines—their advantages, how to choose them and where they are best used. Particularly helpful is a full-page chart on selecting cylindrical brushes. *Osborn Mfg. Co.* . . . for your copy, circle No. 258

Complete line of grinding wheel dressers

If your grinding wheels are loaded or out of round, send for this 24-page book on mechanical, abrasive wheel or stick, and diamond dressers which shows you how to dress and true, and the equipment necessary. More than a dozen dressers are pictured with pertinent data in chart form. A price list accompanies the indexed book. *Desmond-Stephan Mfg. Co.*

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A grinding wheel with eye and cut appeal

Grinding can be colorful too, as witness these grinding wheels: a green one for single point and multi-cutter carbide grinding, and pink for tool and cutter and surface grinding. A resinoid wheel for foundry grinding is detailed also in one of these three brief brochures. *Precision Grinding Wheel Co., Inc.*

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Blast cleaning of castings and forgings

This eight-page manual opens with the principles of blast cleaning, tells how to select a shot size and stable shot and explains carry away and shot quality. The machine and separator to use for the job are briefed. *Alloy Metal Abrasive Co.*

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"All About Coated Abrasive Products"

If you are in need of a summary of essential basic information about coated abrasive products presented simply and briefly, look into this six-page folder aimed at giving you a better understanding of this particular basic production tool. It defines five abrasive minerals, explains grading, backings, adhesives, coatings, trade names and identification. One page matches abrasives to suitable jobs. *Sandpaper, Inc.* . . . for your copy, circle No. 262

Quick glance at cast iron, cut wire shot

Chilled shot, diamond grit and cut wire shot are reviewed in brief in a four-page leaflet on metal abrasives. One page of the illustrated sheet explains how to determine the proper abrasive while the final page recommends sizes of shot and grit for the metal trades. *Harrison Abrasive Div., Metals Disintegrating Co.*

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Introducing the safety back flared cup

Something new under the sun is the flared portable wheel fully reinforced with steel for safe operation. A single notebook page tells you about the special features, such as foolproof mounting, prices and specifications. *Manhattan Rubber Div., Raybestos-Manhattan, Inc.* . . . for your copy, circle No 264

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Abrasive belts for high-speed finishing

Here's a 12-page book devoted to coated abrasive belts for high-speed grinding and finishing the flat or contoured surfaces of metals ranging from soft brass to super hard tungsten carbide, as well as glass, plastics, ceramics and rubber. Drawings and photographs illustrate eight machines for a wide range of typical applications from the small shop to the large factory. Case histories are included. *Minnesota Mining & Mfg. Co.*

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Four-part package on wheels and tools

Four leaflets, all punched for notebooks, note basic data on rubber bonded centerless wheels, cut-off wheels and portable grinders The group outlines operating instructions so you get the best possible cutting, special features and specifications. All four are illustrated. *Manhattan Rubber Div., Raybestos-Manhattan, Inc.*

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90 pages on mounted, grinding wheels

This plastic ringed notebook divides into six complete sections on vitrified bond, resinoid bond, mounted wheels, rubber bond, portable electric grinders and accessories for portable tools. It's a most handy reference with all types of abrasives illustrated, price lists, selection data, speed tables and specifications. Accompanying catalog sheets pinpoint the Slide-Abrader, Super-Flex grinder and a Hi-Power Handee grinder *Chicago Wheel & Mfg. Co.*

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72 pages of general abrasive know-how

If soup and nuts were abrasives, they would be in this 72-page book summarizing just about every abrasive material. Tab-indexed, it divides into sections on hardware and automotive items, sheets, rolls, belts, discs, floor-sanding items as well as general and technical information. Much data are in quick reference chart form. *Clover Mfg. Co.*

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38 pages on low cost abrasive specialties

Cartridge rolls, multiple bands, pads, discs, cones, wheels, bobs—these are just a few of the abrasives highlighted in two illustrated booklets. Pay special attention to the Spinner cross pad, an abrasive tool that lets the user watch his work, as it is like an airplane propeller while it is rotating. *Dayton Abrasive Products, Inc.*

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30 case histories on abrasive belt machine

Here are more than 30 case histories of abrasive belt machine applications with on-the-job production figures, data on types of belts used and their life, fixturing, and comparison with alternative methods. Photos of plant installations disclose the wide variety of parts that the grinders can handle. Specs are included. *Engelberg Huller Co.*

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Potpourri on honing process and equipment

Two books with a total of 54 pages comprise a complete course in honing from a definition of the process, through lessons on honing stones, results that can be expected and preparation to applications and the wide variety of machines you can use. Honing tools and special abrasives complete the course. *Barnes Drill Co.*

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Rounds for de-burring, finishing metals

These dozen pages abound in rods, blocks, discs and wheels for deburring, finishing and polishing metals. A multitude of sizes with a multitude of grains, along with instructions for selecting and specifying, will take care of any metal finishing problem. Accompanied by two service letters and a price list. *Brightboy Industrial Div., Weldon Robert Rubber Co.*

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1958 edition of rubberized abrasive manual

The newest operating methods and applications for rubberized abrasives fill this eight-page manual, just off the press this month. The book recommends these abrasives, available as wheels, points, blocks, sticks and cones in four standard grit textures, for deburring, smoothing and cleaning, for production and assembly line work, in tool and machine shop and for maintenance. A price list accompanies the manual. *Cratex Mfg. Co.*

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Wheels (reinforced resinoid) of progress

Reinforced resinoid wheels are an essential ingredient in foundry, welding and metal fabrication operations. In these 18 pages you'll find the widest selection available between any two covers, with a practical index in which you check your type of operation and are then referred to a specific wheel for the job. *Bay State Abrasive Products Co.*

. . . for your copy, circle No. 274

How to grind and polish appliances

Twelve how-to-do-it pages provide appliance manufacturers with the know-how for pre-finishing, weld grinding and blending, removing imperfections, finishing and polishing with coated abrasives. Large clear pictures illustrate each operation. *Minnesota Mining & Mfg. Co.*

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Grind-O-Flex wheels in new sizes

Grind-O-Flex wheels are now available in smaller sizes for confined contours and larger sizes for use on heavy automatics. Ranging from 3 to 16 in., the wheels are reviewed in two brochures showing design, use and advantages. Both are accompanied by a separate price list. *Merit Products, Inc.*

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Complete study of blast cleaning

You'll find the what, why and wherefore of sand blasting in this 36-page magazine showing many lesser-known as well as every-day applications and all the equipment needed. The complete article, "Blast Cleaning in Industry" is supplemented by a list of more than 350 applications and a handy three-page glossary of terms. *Pangborn Corp.*

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Removing welds with discs and belts

Abrasive discs and belts, along with specialty items for those hard-to-get-at places, are spotlighted in this eight-pager on weld grinding and blending. Here are abrasives for just about every weld grinding operation, so if you have problems along this line send for this 8-page illustrated brochure. *Minnesota Mining & Mfg. Co.*

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Quick answers to mounted wheel questions

A 30-page brochure is designed to answer your questions about mounted wheels quickly and clearly. Each of ten sections, including vitrified bonds and resinoid bond. hard and flexible rubber, standard stock and shapes, speed tables, operating recommendations and general information, is color identified in the index and then tabbed in the book. Illustrated. *Bay State Abrasive Products Co.*

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Meet Borolon, an aluminum oxide tumbling chip

Aluminum oxide in chips and screen grain sizes—that's Borolon. You'll want these two four-page brochures to get acquainted with it. See what it looks like, and how it's made, and read about how and where to use it. *Simonds Abrasive Co.*

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Trends in centerless, cylindrical grinding

Facing the fact that two of the worst headaches in the grinding field are centerless and large cylindrical jobs, this firm has developed what it calls the Progressive Grade wheel, graduated in grade from periphery to hole, to help handle the problem. Find out about it in this illustrated 12-page booklet. *Precision Grinding Wheel Co., Inc.*

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How to buy engineered abrasives

This 10-page manual digs right into the problem of buying the right abrasive for the job with seven basic rules, followed by good general information. It pictures and details a test machine for quality control in the manufacture of steel abrasives and digests data on comparison testing of abrasives. *Abrasive Industries.*

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Grinding wheels and abrasive grain

"A grinding wheel is no better than its abrasive grain," says this eight-page leaflet which shows you in pictures and text the advantages of aluminum oxide wheels for steel, and silicon carbide for cast iron. There are many typical uses shown. *Simonds Abrasive Co.*

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How to finish metal with unique flap wheel

Hundreds of die cut, cloth backed, coated flaps locked in a hub make up the abrasive wheels in these case histories from the appliance. aircraft, furniture. machinery and metal working industries. The 12-page illustrated book checks the wheel's ability to conform to irregular shapes as its main advantage. *Minnesota Mining & Mfg. Co.*

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Four-color picture book on snagging wheels

Grinding wheel users who need the long wear of a hard wheel but the fast cut of a softer one should look into this 12-page book explaining IL bond, an internal wheel lubricant. Abrasive snagging wheels using this resinoid bond are shown in many large and colorful action pictures accompanied by specifications. *Simonds Abrasive Co.*

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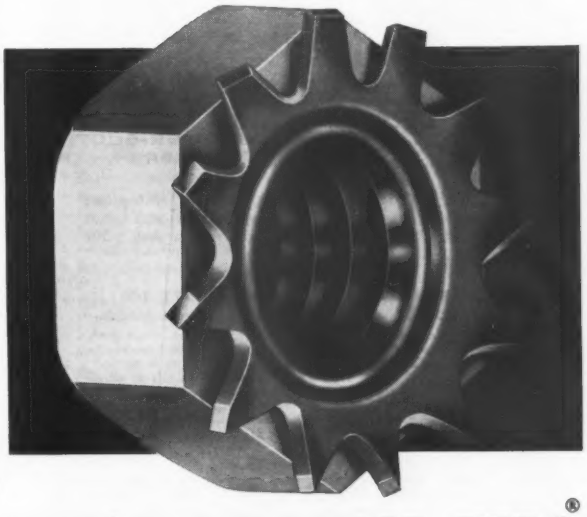

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WI smog interview (cont.) . . . . .

or should it hire outside help? Can its own personnel handle it?

A. The answer depends on a wide range of factors, but I think we can sum it up by pivoting the answer on another question. Does the plant have the engineering talent on its staff and the plant engineering man hours on its staff to do the necessary engineering, recognizing how simple or complex their particular problem may be? The basic problem in outside help is the built-in bias in selecting consulting engineers to do a rounded job for you. It should not be assumed that any professional engineer is equal to any other professional engineer in handling air pollution problems. There are some who specialize in certain industries and types of industries, others specialize in industrial incineration with air pollution control built in. Also the question is frequently raised as to whether the cost of air pollution control of an operation will drive a company out of business. In the 10 years that I have been in this field and in reviewing the 50 years of technical literature covering most of the history of air pollution control in the U. S. *I know of no single instance where a company has been put out of business solely because of the cost of air pollution control clean-up that it either had or faced.* Generally, air pollution control equipment installations can be made without seriously or without at all affecting the competitive position of an industry. Most smaller operations find themselves in competition with other small operations in the same producing and market area. To an increasing extent, air pollution regulations are being established on an area-wide basis that includes an entire market and production area. Even where this is not true, the extra cost minus the benefits and savings of installing air pollution control equipment leaves a balance which is not damaging. It should be recognized that a properly financed company having a prudent fiscal policy and pattern will not only be able to amortize equipment over several years for tax purposes, but actually will amortize it in its internal reserves accounting procedures. Actually, it is the idea of buying non-productive equipment for a non-productive operation that bothers management. Yet, a deeper look beyond the cost sheet will uncover many intangible benefits.

Thank you, Mr. Linsky.

WI INTERVIEW—Southwest Editor Martin P. Semans (left) interviews Benjamin Linsky, head of the San Francisco Bay Area air pollution control board, on how plant managers and engineers can best control air pollution problems.

Improved material handling—the last frontier of profit

(Editor's note: Following is a digest of remarks made by ED SULLIVAN, Western regional vice president of the American Material Handling Society, before a "Bosses Night" meeting of the Denver AMHS. The remarks are especially vital in this era of the need for TIME and MONEY saving in Western plants.)

ED SULLIVAN
AMHS National
Vice President

IN discussing the objectives of the American Material Handling Society Sullivan added one of his own:

> **"That the American Material Handling Society promotes management's recognition of the constantly improving efficiencies being developed on an industry-wide scale within the material handling function, and of the benefits that can be derived therefrom, at the individual plant's level."**

Sullivan then went on to congratulate the Denver AMHS for establishing a practical approach to this objective, by establishing "Bosses Night."

THE IMPORTANCE of material handling was emphasized by Sullivan when he pointed out that in 1948—648,800 production workers in motor vehicle manufacture produced 4,791,621 units . . . In 1957—652,000 workers produced 7,220,000 units! And even though labor and plant expenditure cost went up, the speaker pointed out:

> **"The direct material handling costs were reduced almost 10% . . . a reduction accomplished particularly by the installation of automated, in-line production and mechanized handling equipment."**

SULLIVAN STRESSED the need for improving handling operations by quoting a statement by **M. O. Skidmore,** chief conservation engineer of the Lockheed Aircraft Corp., who said:

> **" '. . . in any existing plant, as long as the machines can't be geared any higher, as long as men won't work any faster, and as long as there is little likelihood that sales can be doubled or tripled in the immediate future, then the LAST FRONTIER OF PROFIT within that plant lies in improving the handling of materials from raw stock through processing, assembly and shipping, and in full utilization of existing space under roof and presently occupied land.**
>
> **" 'This is particularly true among firms with net assets below $1,000,000 who are averaging only 2.9% profit on capital investment, compared to a 6.5% record for big companies which have pioneered the field in mechanized material handling.' "**

SAVINGS—and personal benefits—that can be derived from improving handling operations were emphasized by Sullivan, who cited the example of the industrial engineer who told management they could save millions of dollars by improving material handling. The results?

> **"The aircraft manufacturer immediately initiated company-wide improvements in all phases of material handling, and educational programs to accomplish the objective . . . the engineer who started it all now holds a commanding staff position and is being carefully groomed by his company for still greater things."**

For greater profits in manufacturing, Ed brought out this point:

> **"You should remember that every manufacturing procedure, especially in the material handling area, that has remained unchanged for a decade, can and must be improved in the light of present technical advances, if not today, then on some near tomorrow, when you have to make these improvements to stay in the competitive picture."**

IN PLANT MODERNIZATION programs, Sullivan noted that there are three sources to whom management can look for assistance in improving handling methods: (1) the

. . . *continued on page 85*

11-8

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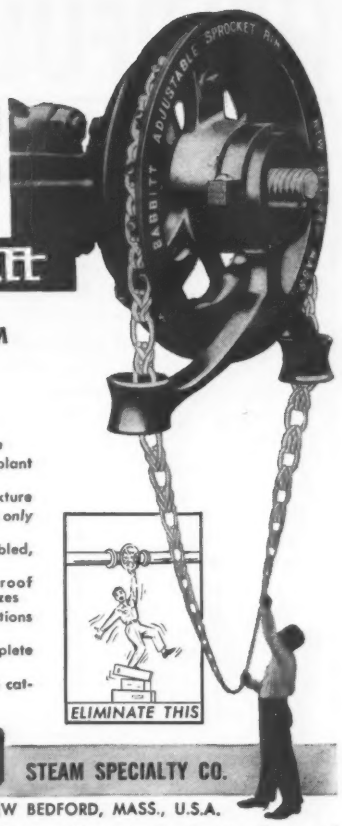

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FOR YOUR FREE COPIES, circle appropriate key numbers on postcard, page 67

Positive visual checking internal, external threads

This handy 12-page manual explains how the H-W visual thread comparators can assure positive checking of product assemble-ability and can speed production and final acceptance gaging of any thread. Many attachments and exclusive features are detailed, to cover all your thread checking problems. Illustrations show you how the comparators are "easy to set up, load and read." Oh, the catalog is standard file size and is perforated to slip into all types of snap binders. *Hanson-Whitney Co.*

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How to select couplings for 150 applications

Five tables in this eight-pager on Sure-Flex couplings short-cut the usual engineering calculations and select the right coupling in a matter of seconds, taking into consideration the type of driver, horsepower and rpm., as well as specific application. Photos shows the flexible coupling, which consists of two flanges and a two-piece rubber sleeve. *T. B. Wood's Son's Co.*

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38 basic data pages on aluminum alloys

Aluminum bronze alloys of the high aluminum, high iron type and the products that are made from them are highlighted in these two booklets. The first, on the metals themselves, reviews specifications, chemical and physical descriptions, while the second, on wrought products, reports on the sheet, rod, tube, fittings and fasteners that can be rolled, extruded, drawn or forged from the alloy. Both books are well illustrated. *Ampco Metal, Inc.*

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Grouping of widely used automatic controls

Between the covers of a single book is a wide selection of the automatic controls most commonly used in designing automatic systems. Engineers will find counting devices, switches, electric valves, actuators, relays, limit and time switches and a host of other building blocks for tailoring automated systems. *General Controls Co.*

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60 pages of versatility for flexible hose, tubing

Betcha didn't know there were so many uses for flexible metal hose and tubing! This fact-packed 60-page manual details hundreds of uses (covering all industries) from acids to wiring conduits. The manual explains the two basic types—corrugated and stripwound—available in bronze, brass, aluminum, monel, steel, strainless steel, and super nickel . . . and outlines their best applications. Included are all types of fittings available. The book abounds in charts, graphs, line drawings and photographs—giving you a complete picture of this flexible metal hose and tubing. *The American Brass Co., American Metal Hose Division.*

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Three specification sheets for electric walkie-stackers

Here are three identical spec. sheets for three electric lift trucks with 2,000, 2,500 and 3,000-lb. lifting capacities in the company's Transporter line. One page of each booklet is a line drawing of the unit from top and side with dimensions and load capacity chart. All are illustrated. *Automatic Transportation Co.*

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120-page loose-leaf book on nut and bolt products

The nuts and bolts that built the railroad West in 1888 are products that you can still use today in manufacturing, construction, transportation, oil production and refining, and many other fields. This ring-bound, tab-indexed notebook of chart data and pictures pinpoints machine, carriage, lag and miscellaneous bolts, nuts, screws, washers, rivets and many other fasteners. The 18 sections are each indexed. *Sheffield Steel Div., Armco Steel Corp.*

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Everything you want to know about industrial heaters

A complete 26-page book on the construction, application and performance of industrial heaters probes features of the heating and ventilating units in 13 performance graphs and charts on steam capacities, air flow resistance and other air flow data. Dimension diagrams and tables for all models and arrangements supplement complete text. *American Air Filter Co., Inc.*

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Flexible impeller pump with a rotary cam

Here are details on a basically new design for a pump, which lowers operating costs and increases volume and pressure, while reducing horsepower required. This substantially increases the life of the rubber impeller and simplifies installation on any standard ⅓-hp. motor. The four-page booklet points out the advantages of this new motor as opposed to other rubber impeller pumps. An instruction manual is included. *Oberdorfer Foundries, Inc.*

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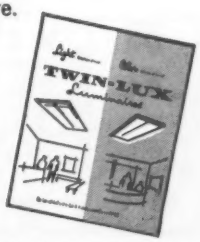

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The only manufacturer of woven wire conveyor belts in the West describes the profitable details of this belt which is flexible, heat resistant, porous, sanitary and immersible. A wide variety of weaves fits all purposes, as shown by photos in the brochure. Actual plant operating shots are included to round out the picture of this versatile belt. *Alloy Wire Belt Co.*

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Property and spec book for brass alloy products

A 16-pager on chemical composition, physical and mechanical properties and specifications for brass alloy products offers data in quick-reference chart form throughout. Table of contents lists rod mill products, wire, welding rod, forgings, die castings and finally, a helpful numerical alloy list. *Titan Metal Mfg. Co.*

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Introduction to hydraulic multi-stroke hand truck

A four-page leaflet introduces a newly designed hand lift truck for heavy skid and unit loads. Specifications, cutaways and pictures of the truck in operation give you complete information on the four-model series. *Barrett-Cravens Co.*

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How to find weights for steel tubing

Simple instructions for finding the weights of square and rectangular steel tubing make up a 12-page booklet which gives a standard factor for converting round steel tubing weights to square or rectangular. Tables cover sizes ranging from 1/16-in. O.D. with a .004-in. wall thickness to 10¾-in. O.D. with a 1⅝-in. thickness. Designers, engineers and traffic men can apply data to welded or seamless steel tubing. *Revere Copper & Brass, Inc.*

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Application book on Select-A-Spede

This picture book of applications for Select-A-Spede, an adjustable speed drive available with 5 to 200 hp., displays the unit with machine tools, in metal processing, textile and paper making, and with test stands and conveyors. The 12-page booklet stresses each of installation and optional features for special applications, as well as savings that the d-c drive provides. *Louis Allis Co.*

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8-page photo album on tensioning tools

The story of steel strapping application using stretchers is told in pictures in this eight-pager, which keeps text to a minimum and gives specifications in brief chart form. Sealers, seals and dispensers for use with strap tensioning tools are briefed on the final page. *Acme Steel Co.*

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8-page cartoon book on fork truck safety

Safety is something we're always hearing about. It's also something we can never hear enough about. Bearing in mind that 25% of employee disabilities result from poor material handling methods, this lighthearted but serious tip sheet brings home the work truck safety basics such as careful choice of operators and adequate instruction in all operating procedures. *Lewis Shepard Products, Inc.*

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Application picture book for industrial masking tape

Thirty pictures illuminate as many uses for 13 Scotch brand masking tapes in this six-page folder, which includes technical properties of the tapes and additional lists of uses for which each tape is best suited. Application pictures range from general masking to high heat masking to plant maintenance. *Minnesota Mining & Mfg. Co.*

. . . for your copy, circle No. 167

32 pages on complete line of blast cleaning machines

This illustrated book on Wheelabrator's entire line of airless blast cleaning machines also reviews wet blast, air blast and dust control equipment. It presents for the first time a complete line of Super Tumblasts, a heavy-duty, batch-type centrifugal machine available in three sizes, and touches on cast steel shot and grit abrasives, sandcutters and core rod straighteners. *Wheelabrator Corp.*

. . . for your copy, circle No. 168

Data on ball bearings, pillow, flange blocks

List prices and specifications comprise this 12-page notebook on bearing units. Photos illustrate many special features of the blocks and bearings, while line drawing show heights and dimensions. Comparison charts complete the book. *Browning Mfg. Co.*

. . . for your copy, circle No. 169

Introducing Majik-Loder with horizontal stacking

This brochure introduces a new horizontal stacking fork truck designed to solve many material handling problems and cut costs in freight shipping. A table of specifications briefs you on the basics, while photos give an idea of the unit's potential. *John Morell Mfg. Co.*

. . . for your copy, circle No. 170

How to machine, finish thermoplastic material

"Machining Thermoplastics," a five-page illustrated reprint from *Modern Plastics Encyclopedia*, indicates procedures for sawing, routing, drilling, turning, shearing, punching, grinding and finishing acrylic, nylon, fluorocarbon and polyethylene. It also recommends tools, feed and speed, and coolants to be used. *Cadillac Plastic & Chemical Co.*

. . . for your copy, circle No. 171

Power strap feeder gives more than 50 lashes

A four-page folder of schematic drawings pictures in horizontal and vertical position a power strap feeder that straps more than 200 medium-sized packages per hour. Special features and advantages of the unit are listed, while short paragraphs explain installation and operation. *Signode Steel Strapping Co.*

. . . for your copy, circle No. 172

How to prevent on-the-job skin diseases

About two-thirds of all occupational diseases are skin troubles. In "The Prevention of Occupational Skin Diseases," Dr. Louis Schwartz, retired medical director of the U. S. Public Health Service, explains how many such diseases can be averted. *Huntington Laboratories, Inc.*

. . . for your copy, circle No. 173

Colorful 40-page magazine on German automatic lathes

The 10 sections of this magazine introduce Traub's automatic cutting, turning and boring equipment with clear photographs and text in English. Included are lathes, a wide selection of attachments, nut tapping and countersinking machines, cam milling units and auxiliary shop equipment. *Hermann Traub, Engineers.*

. . . for your copy, circle No. 174

Operation principles of air compressors

An eight-page two-color leaflet on 1 to 2-hp. pumps for supplying air in the 150 to 175-psi. range, details principles of operation with cutaway diagrams, lists of features and operating and mounting specifications. *American Brake Shoe Co.*

. . . for your copy, circle No. 175

High strength plates for construction field

High strength steel plates, designed for bridge and dam construction and for excavating and marine work, make up a four-page folder. Advantages mentioned are light weight, strength, good welding properties and resistance to atmospheric corrosion. *Colorado Fuel & Iron Corp.*

. . . for your copy, circle No. 176

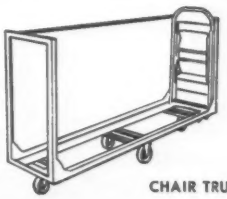
STEEL

CHAIN

HSCO — IN STOCK AT HOWARD SUPPLY COMPANY

. . . for more details, circle No. 48

UTILITY TRUCK



CHAIR TRUCK

COMMERCIAL *and* INSTITUTIONAL *Equipment*

TRAY TRUCK

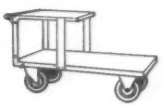
SHELF TRUCK

FOOD CONVEYER

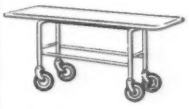
GARMENT RACKS

DISH TRUCK

MOP TRUCK



KITCHEN TRUCK



STRETCHER

SPECIAL TRUCKS **are designed and built by Colson to your specifications. Phone or write for engineering assistance.**

COLSON

CASTERS • WHEELS • HAND TRUCKS

COLSON EQUIPMENT & SUPPLY CO.

LOS ANGELES 13 1317 Willow Street • TRinity 5743
OAKLAND 7 350 Tenth Street • TEmplebar 2-3556
SAN FRANCISCO 5 20 Beale Street • GArfield 1-0280

. . . for more details, circle No. 49 on Reader Service Postcard

Cost-cuttng idea book on overhead doors

This eight-page leaflet stresses the plant operating economies possible with electric-operated overhead doors, pointing out that less heat is lost and workers' time is saved. Case material demonstrates methods by which savings can be computed as it shows products and installation requirements. Specifications and drawings are included. *Barber-Coleman Co.*

. . . for your copy, circle No. 177

Expanded line of exchangers in every size for every job

A colorful eight-page booklet contains data on the principal features, performance improvements and new designs of an expanded line of BCF exchangers. Specifications detail 46 sizes in one, two and four-pass designs, while one page directs attention to modifications for special conditions. *Ross Heat Exchanger Div., American Radiator & Standard Sanitary Corp.*

. . . for your copy, circle No. 178

Here's a new wrinkle in industrial clothing

Garments, gloves and aprons impregnated with polyvinyl chloride to resist virtually all industrial chemicals comprise these three booklets on the range of sizes, styles and colors available and special advantages for chemical, drug and food processing industries. All books have pictures of the lightweight, flexible clothing. *Jomac, Inc.* . . . for your copy, circle No. 179

Spec sheet on 9 models of 12,000-lb. carrier

Specifications for the nine models of this 12,000-lb. capacity straddle carrier make up a four-page, two-color brochure. Sketches illustrate turning radius of each model while brief space is devoted to components. *Clark Equipment Co.*

. . . for your copy, circle No. 180

Cut production costs with ring and circle shears

"Designed for the thrifty sheet metal shop"—that's what this eight-page leaflet says about power and hand-operated ring, circle and slitting shears. It describes features of three lines, pictures many models and the work they can do and furnishes complete specifications. *Niagara Machine & Tool Works.*

. . . for your copy, circle No. 181

Analyzer worksheets for busy engineers

These analyzer worksheets have been prepared to help engineers working on Servosystem or component test and design. Almost any photographic duplicator will produce a supply of work forms from these transparent masters. The forms give a standardized permanent record of the system or component under test. Sets are available from *Servo Corp. of America.*

. . . for your copy, circle No. 182

Weather-protected motors designed for rain or shine

This six-page fold-out stresses the outdoor dependability of a line of motors built to NEMA and ASA standards in sizes NEMA frame 505 through 800 hp. at 3,600 rpm. Pictures and drawings exhibit features of the steel frame, stator assembly, insulation, bearings, ducts and screens. Motors suit electric utilities, water works, refineries, paper mills, mining and chemical industries. *Allis-Chalmers.* . . . for your copy, circle No. 183

Economy Weapon—Hard Surfacing Maintenance

This 20-page technical book, a special issue of the semimonthly *Technical Information Digest*, treats wear and the need for overlays for abrasion, corrosion, friction, heat and impact. Some 57 photos illustrate overlay applications and hard surfacing welding procedures, while case histories show successful overlays in the field. Charts provide additional data. *Eutectic Welding Alloys Corp.*

. . . for your copy, circle No. 184

Tab-indexed notebook solves gritty problems

"Grit Collecting and Grit Washing Equipment," an illustrated 28-page booklet, assumes that every plant, large or small, has grit problems (isn't it the truth?) and sets about helping to solve them. Here are seven straightline grit collectors, two straightline washers and a tritor screen all diagrammed, explained and accompanied with specifications and dimensions. *Link-Belt Co.*

. . . for your copy, circle No. 185

Catalog sheet describes abrasives protector

The use of Armorite as a liner, curtain, throw mat or pad for protection against abrasives is described in this catalog sheet. The sheet, which outlines Armorite specifications, also explains its advantages for ore, sand or gravel operations, in sandblast cabinets and flotation cells and on dredge pumps and cyclone collectors for abrasive dusts. Sections on installation and choosing the right thickness are included. *B. F. Goodrich Co.*

. . . for your copy, circle No. 186

Cost-cutting tips in the MH field

Men in the material handling field who are looking for ways to cut man-hour costs and improve plant efficiency may find some answers in "Pertinent Facts on Materials Handling," a folder packed with current engineering information and data on some of the latest accessories available for speeding MH operations. The booklet also offers specific solutions to handling problems that involve different types of loads in a variety of industries. *Towmotor Corp.*

. . . for your copy, circle No. 187

Facts about control system on central station boiler

Using a station of Carolina Power & Light Co. as an example, this 12-page booklet explains the application of automatic control systems to large central station boilers. Covered is the operation of the combustion, feedwater, feedpump and soot-blowing control systems. A schematic diagram shows how the individual components are integrated into supervisory systems while numerous photographs show other aspects of the application. *Copes-Vulcan Div., Blaw-Knox Co.*

. . . for your copy, circle No. 188

RAZOR-BACK

SHOVELS

HSCO IN STOCK AT HOWARD SUPPLY COMPANY

. . . for more details, circle No. 50

Design guide covers sleeve-type half bearings

Divided into parts on materials, standard sizes and standard design fundamentals and features, this 16-page automotive sleeve-type half bearing design guide is also indexed. Included is such information as industry standards, how to determine shaft size, nomenclature with accompanying standards for design, undersize bearings, rust prevention and marking. Photo-illustrated, the book also has line drawings and tables. *Federal-Mogul Div., Federal Mogul-Bower Bearings, Inc.*

. . . for your copy, circle No. 189

155-page service manual of transformer know-how

Here's a manual that all operating and maintenance personnel who have anything to do with transformers should have. A loose-leaf pocket-size notebook with metal rings, it is divided into three complete sections, each indexed. A general information section pinpoints handling, inspection, location and installation, gaskets, insulating and cooling liquids, operation, and reconditioning of flooded units, while section two classifies transformers. A final section on industry standards furnishes electrical details, data on connections and general precautions. Photographs and line drawings illustrate this exceptionally complete book. *Allis-Chalmers.*

. . . for your copy, circle No. 190

7 key reasons for using twin arc welders

Each of these "Seven Keys to Welding Profit" is a reason why you should use a twin arc welder in pipeline, oil drilling, bridge building and railroad construction, as well as in metal fabricating and machine repair. Keys point to and pictures illustrate reliable power, steady arc, dual control, parallel power, diesel economy, portability and dealer service. *Caterpillar Tractor Co.*

. . . for your copy, circle No. 191

How to package lumber for freight car shipment

"Packaged Lumber and Interlace Load Securement" logs the hows, whys, and wherefores of a simple, yet damage-proof, method of packaging and shipping lumber by freight car. Tools and equipment necessary for loading both flat and closed cars are pictured. *Acme Steel Co.*

. . . for your copy, circle No. 192

"Electrochemicals . . . Gifts of the Firebird"

Like the legendary phoenix, who cast himself into a roaring fire only to emerge more splendid than before, some of today's elements become magic compounds for chemical processing and metal alloying after passing through the white-hot electric furnace. This 16-page book presents the physical properties of 23 such products, including borides, carbides, nitrides and fused oxides, with present and possible future uses and availability. *Norton Co.*

. . . for your copy, circle No. 193

Digest on solenoid valves, electromagnetic controls

A four-page notebook insert condenses a complete line of solenoid valves—2, 3, and 4-way, corrosion resistant, manual reset and special purpose—and electromagnetic controls—automatic transfer and remote control switches, contactors, relays, solenoids and electric plant controls. Product pictures pinpoint important units. *Automatic Switch Co.*

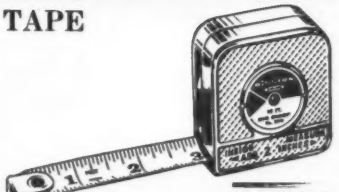
. . . for your copy, circle No. 194

All about steel buildings with panel construction

An 8-page brochure spotlights Armco's steel buildings with Steelox panel construction, showing shed roof, gable roof frameless and gable roof rigid frame types. It outlines construction features, lists advantages and concludes with accessories available for the buildings. *Armco Drainage & Metal Products, Inc.*

. . . for your copy, circle No. 195

TAPE



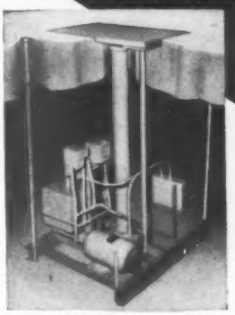
RULES

HSCO

IN STOCK AT HOWARD SUPPLY COMPANY

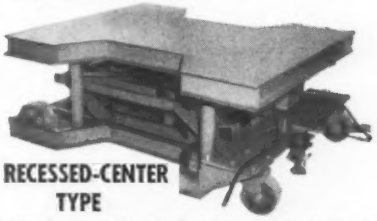
. . . for more details, circle No. 51

You, too, may benefit with **Weld-Bilt** HYDRAULIC LIFT TABLES like these



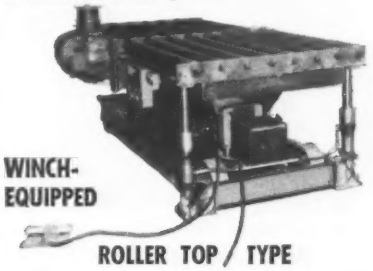
THRU-THE-FLOOR TYPE

Suspended below the floor, with platform top at floor level — lifts skidloads to machine level for effortless production.



RECESSED-CENTER TYPE

Affords flexibility in handling steel sheets of varying widths. Raises sheets to press height without manual lifting.



WINCH-EQUIPPED ROLLER TOP TYPE

Motor Driven Winch moves heavy dies on or off presses on free-running rollers. Raised and lowered by two-way foot pedal control.

Your plant, too, may have many moving, lifting, or production feeding operations that may be more profitably done with WELD-BILT HYDRAULIC LIFT TABLES. Write, outlining your need. We'll be glad to suggest an economical solution.

West Coast Representatives

P. F. O'Donnel Co., 2298 Jerrold Ave., San Francisco; **Keville Ind. Service,** 1590 Ganesha Place, Pomona; **Equipment Supply Co.,** 16 Post Office Place, Salt Lake City; **Equipment Engineering Co.,** 1400 Ruth Drive, Thornton, Colorado; **Stryco Sales Inc.,** 312 Industrial N. E., Albuquerque; **Hallidie Machinery Co.,** 1915 N.E. Union, Portland; **Preston Faller Co.,** 1921 Minor Ave., Seattle; **Liftco, Inc.,** 4324 East Trent Ave., Spokane.

Weld-Bilt Vertical Floor to Floor Transportation Systems — Lift Trucks — Portable Elevators — Automatic Elevators.

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
307 WATER STREET • WEST BEND, WIS.

. . . for more details, circle No. 52

NEW EQUIPMENT for Western plant operation, production, and maintenance

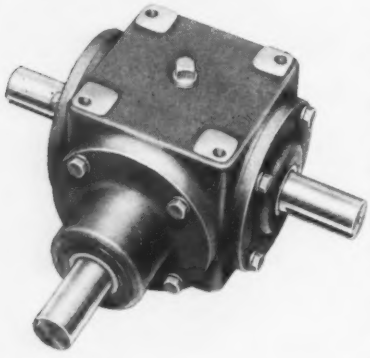
USE RIP-OUT POSTCARD, page 67, for more information on products described

ELECTRIC METALS TRUCKS
. . . for handling lightweight coil

Models of 15,000 and 16,000-lb. capacities have been added to Yale's line of medium capacity, electric-powered metals handling trucks to meet the need for handling lightweight coil. The smaller overall dimensions of 124 x 61 in. make operation in congested areas much easier. Trucks have dual operating stations so drivers can see better. *Yale Materials Handling Div., Yale & Towne Mfg. Co.*

. . . for more details, circle No. 201 on postcard

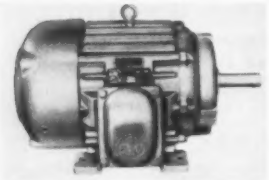
ANGLE GEAR BOXES
. . . a versatile trio



Available in three basic models, with various speeds, horsepower and ratios, these gear boxes can fill just about every gear box need. Model 66, in ratios of 1 to 1, 1½ to 1 or 2 to 1, has a standard shaft size of 1½ in., and hp. rating up to 25. Model 88, for heavier loads, also has 3 to 1 gear ratio with hp. up to 50, and comes with a 1⅝-in. standard shaft. Model 99, the extra heavy duty box, is fitted with heavy duty truck ring gear and pinion and gives you a choice of three ratios—40 to 6 tooth, 37 to 9 tooth, or 34 to 7 tooth. All have Timken bearings. *Hub City Iron Co.*

. . . for more details, circle No. 202 on postcard

YOU CAN PLAY WITH FIRE
. . . around explosion-proof motors



Hazardous locations plus electric motors can add up to fire and explosions, but not with this line of totally-enclosed units, designed specifically for combustible atmospheres. Built to NEMA standards and UL approved, the fan-cooled Model KZCX has ratings of 1½ to 30 hp., while the Model KZEX, a non-ventilated type, has ratings of 1½ hp. and lower. Laminations for the Copperspun rotor are made of electrical sheet steel, while stator cores are built from core-plated silicon steel sheet laminations. Each stator receives a high voltage test in accordance with the AIEE test code. *Fairbanks, Morse & Co.*

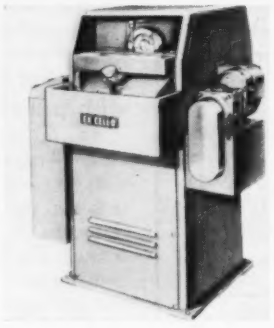
. . . for more details, circle No. 203 on postcard

ROTARY COMPRESSOR
. . . of small general utility size

Here's a single-stage, sliding vane compressor weighing only 55 lb., yet with a rated output equal to that of a piston unit weighing more than twice as much. The compressor is made in 1½ and 2-hp. ranges for garages, paint shops, machine shops and other operations where air pressure is needed. Compression up to 200 lb. sq. in. is available with the unit. *American Brake Shoe Co.*

. . . for more details, circle No. 204 on postcard

TWO-IN-ONE TOOL
. . . for standard, electrolytic grinding



One of two off-hand tool grinders, both of the double-end reciprocating type, is designed for conventional grinding with vitrified or diamond wheels, while the other is equipped with metal-bonded diamond wheels for electrolytic grinding. Both perform two jobs in one: conventional grinding at one end and chip-breaker grinding at the other. Both have adjustable, power-controlled reciprocation of the grinding wheels and vertically adjusted table. *Ex-Cell-O Corp.*

. . . for more details, circle No. 205 on postcard

HI-LADDER TRUCK
. . . extends for 16-ft. reach

Here's a mobile but non-powered maintenance truck with a ladder that extends 8 ft., 3 in. off the ground, giving a practical reach to 16 ft., yet when telescoped will pass through a standard 6-ft., 8-in., doorway. Ladder is stable when extended as it locks in place with double independent locks. Retractable front casters let the ladder stand on firm legs while one adjustable leg will compensate for uneven floors. *Rol-Away Truck Mfg. Co., Inc.*

. . . for more details, circle No. 206 on postcard

this is *modern* industrial *lighting*

Another easy-to-see improvement in plant lighting

Ask the people at Marchant Calculators Inc. about industrial lighting and they'll tell you, "Adequate lighting doesn't cost – it pays!" This modern *general* lighting in Marchant's new Oakland plant makes *individual* lighting at work benches unnecessary. It's designed to direct 10% of the light upward to the ceiling and thus reduce shadows and glare that cause eye strain and human error.

It's a matter of record that the soft, even light produced by modern fixtures creates a better seeing environment and improves both the quality and quantity of work. This is the kind of modern plant lighting you'll learn more about by sending for the free booklet offered below.

Northern California Electrical Bureau

This message sponsored by

Pacific Gas and Electric Company

Northern California Electrical Bureau
1355 Market St., San Francisco 3

Without obligation or cost, please send me the "Fact Book on Certified Lighting for Industry."

*Name*_____

*Company*_____

*Address*_____

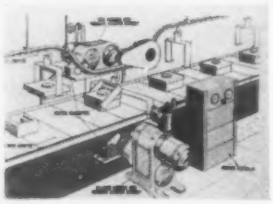
. . . for more details, circle No. 53 on Reader Service Postcard

4-WHEEL MAGNESIUM TRUCKS
. . . new features in popular sizes

Many new features are incorporated in these 4-wheel magnesium floor trucks, available in popular sizes and capacities of 500, 1,200 and 1,500 lb. They include: smooth deck with rolled edges for maximum protection to loads and floor fixtures; standard round corner castings for extra strength; reversible tubular handles for installation in corner sockets at either end of truck. Rubber bumper strip may be installed for various applications. The new trucks may be purchased equipped with casters, but are also available without casters for users desiring to adapt their own standard casters to light-weight, modern 4-wheeled equipment. Caster mounting will accomodate normal variation in popular caster models. *Magline, Inc.*

. . . for more details, circle No. 207 on postcard

CONTROL SYSTEM
. . . to synchronize conveyors



A new position or link synchronization control system permits variable speeds of assembly or production conveyors on applications, primarily in the automotive and appliance industries, where absolute synchronization is needed. System consists of two Varidrive or Varidyne motors, one for the lead conveyor and one for the follower, a position controller and two position transmitters. *U. S. Electrical Motors, Inc.*

. . . for more details, circle No. 208 on postcard

USE COPPER TUBE
. . . throw away cardboard reels

Disposable cardboard reels for copper tubing eliminate a lot of the problems and expense associated with conventional steel reels. Less than one-tenth the weight of the metal units, the cardboard reels do away with the bookkeeping involved in keeping track of reels and the deposits on their return, also eliminate time and labor in handling and storing. *Chase Brass & Copper Co.*

. . . for more details, circle No. 209 on postcard

SINGLE-STAGE REGULATOR
. . . delivers heavy gas flow

Series 8100 inverse-type regulators, whether for oxygen, acetylene, hydrogen, nitrogen, argon, helium or carbon dioxide, are designed to give a high delivery rate and maintain constant delivery pressure. They allow low cylinder pressure end points so that the gas is more completely exhausted from the cylinder. The ribbed body ring makes inspection and maintenance easy. *Air Reduction Pacific Co.*

. . . for more details, circle No. 210 on postcard

TINY PUNCH PRESS
. . . for precision instrument work

Seven inches high and weighing but 3½ lb., this Mini-Line press is designed for fine punching, staking and forming operations in laboratories and for short-run production jobs. It has a controlled ⅜-in. stroke and can be operated either right or left handed, as well as forward and back. A wide selection of accessories, including a set of 10 round punches and die set, is available. *Magnetec Corp.*

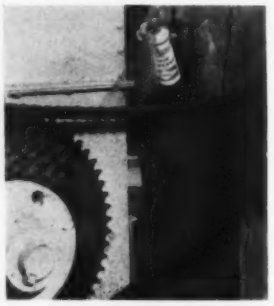
. . . for more details, circle No. 211 on postcard

ALL-PURPOSE SUCTION PIPE
. . . is lightweight and portable

You name it and this flexible aluminum pipe can do it: drain excavations or ditches, divert streams, pump out barges, fight fires or substitute as a water supply line. The suction line, from source to pump, can be as long as you want—from 5 ft. to several thousand—and is made by coupling 5 to 40-ft. lengths of 3 to 8-in. diameter pipe with steel coupler ends. A V-type suction gasket at each coupling junction allows an 11-deg. off-center movement in any direction without breaking the suction seal. *W. R. Ames Co.*

. . . for more details, circle No. 212 on postcard

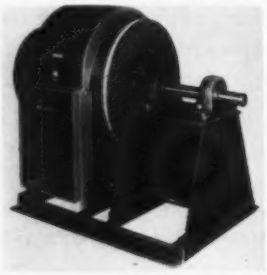
PUSHBUTTON CONTAINER
. . . sprays chain lubricant



Push a button and presto, a fine controlled spray of lubricant is deposited uniformly on all chains. Nu-Aero heavy-duty chain lubricant in its easy-to-handle aerosol-type container is recommended for use on heavy industrial and construction equipment with moderate or slow speed chains, while Nu-Aero roller chain lubricant is for smaller high-speed chains. Both contain rust preventatives and anti-wear additives. *Pressure Products Co.*

. . . for more details, circle No. 213 on postcard

DURA-TEMP FANS
. . . blow a lot of hot air



This line of heat fans, handling temperatures to 1,650 deg. F., utilizes a new principle for preventing high temperatures inside the fan from reaching the bearings and causing trouble; a rotating member of dissimilar alloy, fitted to the shaft, radiates and circulates ambient heat away from the bearing areas. The Dura-Temp line runs from 600 to 30,000 cfm. *General Blower Co.*

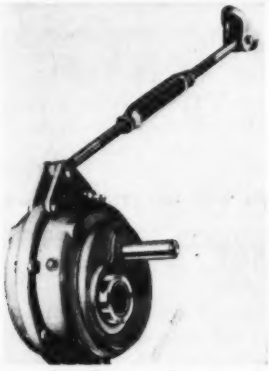
. . . for more details, circle No. 214 on postcard

LOAD LUGGER CART
. . . helps fill orders quickly

You can do a speedy job of filling parts orders with this load lugger cart. As each lug is filled it slides into a pair of runners where it is suspended by the rims. Lugs are easy to remove and transfer, and heavy-duty, ball bearing swivel casters make the cart easy to push. *McClintock Mfg. Co.*

. . . for more details, circle No. 215 on postcard

GOODBYE, ALIGNMENT PROBLEMS
. . . with shaft-mounted reducer



This shaft-mounted gear reducer, eliminating motor bases, rails, supporting structures and flexible coupings, provides a space-saving power transmission unit for countless industrial applications. The 18 stock models, including single and double-reduction types, let you bid goodbye to alignment problems, at the same time making possible infinite speed ratios through the use of variable speed pulleys or by changing sheaves, sprockets or prime mover speed. *Lovejoy Flexible Coupling Co.*

. . . for more details, circle No. 216 on postcard

ELECTRIC MOTOR LINE
. . . in ranges from 1/3 to 800 hp.

Smith's line of electric motors has been expanded to include new explosion-proof, totally-enclosed and splash-proof models. The company now offers fractionals from 1/3 to 1 hp., and single-phase integrals from 1 to 5 hp. Polyphase drip-proof integrals from 1 to 800 hp. are also included, with all models meeting current and old NEMA frame sizes. *A. O. Smith Corp.*

. . . for more details, circle No. 217 on postcard

1,000-CAPACITY LIFT
. . . stacks drums three high

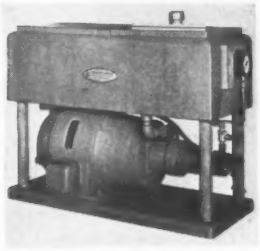
Metal and fibre drums can be stacked three high with this battery-operated drum handling truck which automatically picks up and releases drums and tiers them without pallets. It will handle any type drum regardless of rim size and works in any location. Available with lifting heights from 62 to 90 in., the 22 in. wide truck is easily maneuvered down a standard 24-in. drum aisle. Drum handling device can be quickly interchanged with lifting forks. *Big Joe Mfg. Co.*

. . . for more details, circle No. 218 on postcard

NOW AVAILABLE FOR IMMEDIATE DELIVERY

CIRCUIT LAYOUT ★ SYSTEM DESIGN ★ FABRICATION ★ COMPLETE STOCK ★ PARTS-SERVICE ★ "A working room for industry"

Fornaciari-designed and developed power units that deliver top performance with simplest maintenance!



CLEAN! COMPACT! PORTABLE!

Tank-over-pump assemblies, employing the finest components for highest efficiency in any application to 8000 psi and 20 gpm.

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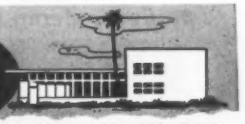
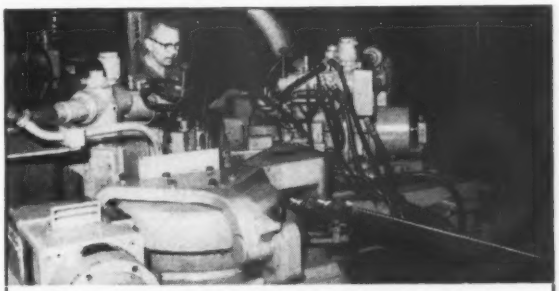


5350 EAST WASHINGTON BLVD.
LOS ANGELES 22, CALIFORNIA

. . . for more details, circle No. 54 on Reader Service Postcard



"We've Used Aeroquip Hose Lines for over 4 years Never Had a Failure," Reports Maintenance Man

EATON MANUFACTURING CO., AXLE DIVISION, CLEVELAND

On automatic and semi-automatic machinery in Eaton's Cleveland axle plant, flexible hose lines are important hydraulic system components. Aeroquip Hose and Reusable Fittings were first used almost five years ago, on a small scale. They performed so well that Eaton maintenance men now systematically replace other hose and tubing with Aeroquip Hose Lines.

You can cut maintenance costs and add dependability to your equipment, too. Call the Aeroquip Distributor listed in your Yellow Page Phone Book, or write us.

Aeroquip

AEROQUIP CORPORATION, WESTERN DIVISION, BURBANK, CALIFORNIA

Sales office and warehouse for Oregon, Washington and Idaho: Sparks Aeroquip Northwest, Inc., 1624 S. E. Grand Ave. Portland 15, Oregon

Aeroquip Products are fully protected by patents in U.S.A. and abroad.

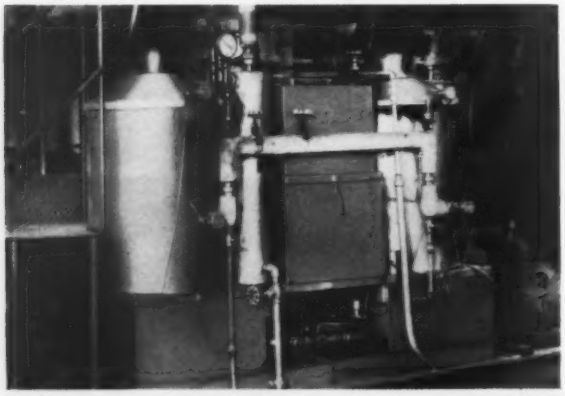
. . . for more details, circle No. 55 on Reader Service Postcard

55-GAL. DRUM
. . . for money in the bank

This 55-gal. drum—a miniature—is a coin bank for manufacturers who sell their products in drums. Made to order, it can be lithographed with your own wording, colors and design. Give them to your customers—present and future—and they'll always remember you and your products. Bank is 2¼ in. in diameter and 3¼ in. high. *George D. Ellis & Sons.*

. . . for more details, circle No. 219 on postcard

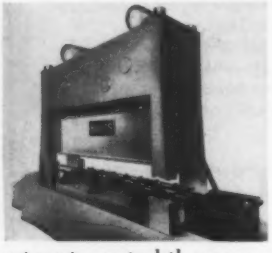
PACKAGE GENERATOR
. . . produces steam in a flash



This flash-type steam generator with continuous coil construction produces live steam in 2 to 3 min. Available in 3 to 30-boiler hp., it is a complete package that can be installed anywhere steam is needed, saving the cost of piping, and requires no special foundations or insulation. The unit produces quick steam without a boiler so no licensed operator is needed. *Malsbary Mfg. Co.*

. . . for more details, circle No. 220 on postcard

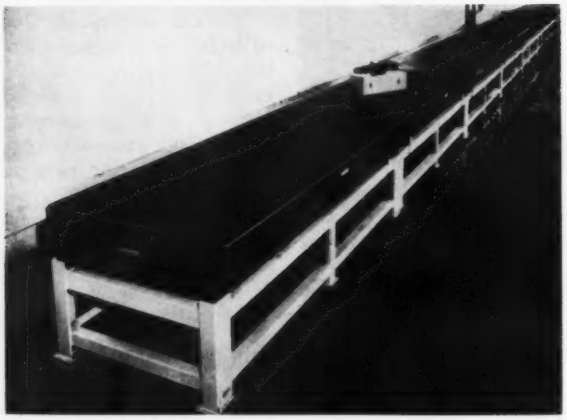
TRANSFER FEED CONTROL
. . . converts straight side press



This self-contained transfer feed console will convert most straight side presses to automatic transfer feed drive operation. Basically an automation device, it is operated through one power take-off from the press crank or can be independently powered and set up to control the press cycle. Since it's not attached to the press, it requires no special mounting provisions on the press frame. *E. W. Bliss Co.*

. . . for more details, circle No. 221 on postcard

80-FT. GRANITE PLATE
. . . another first for the West



Thought to be the largest granite surface plate in the country, this 80-ft. assembly was built in eight sections of 10 ft. each and doweled together. The 4-ft. wide black plate, manufactured for an aircraft firm, has an overall tolerance of .005 to .007 in. with each section accurate to .001 in. It stands in specially engineered steel supports. *AccuRite Surface Plate Co.*

. . . for more details, circle No. 222 on postcard

CONVEYOR ASSEMBLY TRAY
. . . is lightweight but durable

This assembly tray, molded in one piece of Fiberglas reinforced polyester resin, is lighter than aluminum, yet very strong. It has additional advantages of resistance to grease and most chemicals, will not shatter or dent, and stands up well under temperature extremes. Available 19 in. wide, 45 in. long and 5½ in. deep with front cut low for easier access. *G. B. Lewis Co.*

. . . for more details, circle No. 223 on postcard

MINIATURE DISPATCHER
. . . issues calls to duty

Occupying only one-fifth of a cubic foot, this compact radiophone with transistors and plated circuitry can be mounted on any material handling truck. The multi-voltage, low-drain Dispatcher comes in models for all battery voltages found on industrial vehicles from 6 vdc. on up and including a 117 vac. model. All units come in two designs, one completely self-contained for installation in a single mounting location near the operator and the other for separation of radio set and speaker, microphone and controls. *Motorola, Inc.*

. . . for more details, circle No. 224 on postcard

WOVEN WIRE CONVEYOR
. . . handles bagged bulk materials

This belt conveyor for moving bags of cement, lime, talc and other bulk materials has adjustable spring shock absorbers to support the roller platform and eliminate bag breakage. Springs adjust for bags of varying weights. Belt is self-cleaning. Available as a portable unit or a permanent installation. *Hewitt-Robins, Inc.*

. . . for more details, circle No. 225 on postcard

LOW-LIFT HAND TRUCKS
. . . of mechanical and hydraulic types

Automatic Transportation has introduced an industrial hand truck line with seven models—five mechanical and two hydraulic. Skid platform models are included, as are pallet types standardized with forks 36, 42, and 48 in. long. Capacities range from 1,000 lb. in the mechanical lift to 10,000 lb. in the heavy-duty hydraulic multiple stroke models. Pictured is Model AH, a heavy-duty hydraulic lift with single and double-faced pallet and tire plate. *Automatic Transportation Co.*

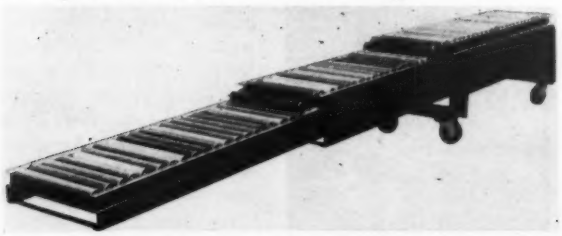
. . . for more details, circle No. 226 on postcard

LUBRICATING GREASE
. . . resists atomic radiation

A radiation-resistant grease, called Shell APL grease, has been designed for use in nuclear power plants where it will be subject to atomic radiation. It has passed both static radiation and mechanical stability tests. *Shell Oil Co.*

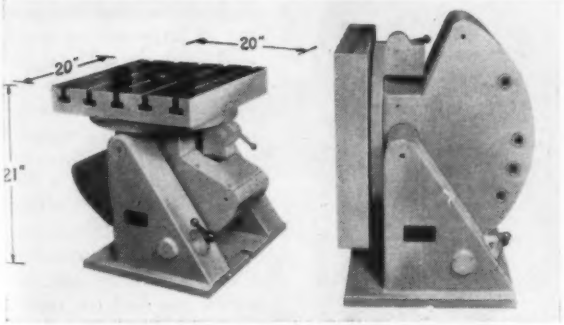
. . . for more details, circle No. 227 on postcard

TELESCOPING CONVEYOR
. . . speeds van and truck loading



With their two or three telescoping cantilever sections, these conveyors speed up loading and unloading operations and cut down on the number of people needed for the job. The first section rests on the floor dock or truck bed, while the telescoping sections extend with a 10-lb. pull. The two-section model extends to 18 ft., the three-section up to 30 ft. Since there are no legs the unit is easy to handle inside a truck. Available in 12, 18 and 24-in. widths. *Wilkie Co.* **. . . for more details, circle No. 228 on postcard**

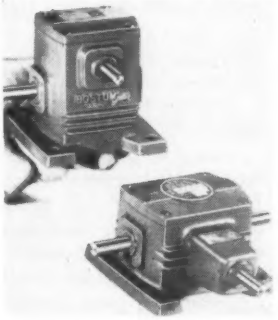
TILT-A-TURN TABLE
. . . hastens drilling, boring work



This heavy-duty worktable for radial drilling, tapping and boring is designed for both angular and radial positioning of workpieces. It provides 360-deg. rotation and eight equally spaced radial locating holes. Cradle-type design permits tilting work in a number of different planes from horizontal to vertical, making it possible to perform an almost unlimited number of matching operations on a range of work. *Galger Engineering & Mfg. Co.*

. . . for more details, circle No. 229 on postcard

LITTLE SPEED REDUCERS
. . . for light-duty applications

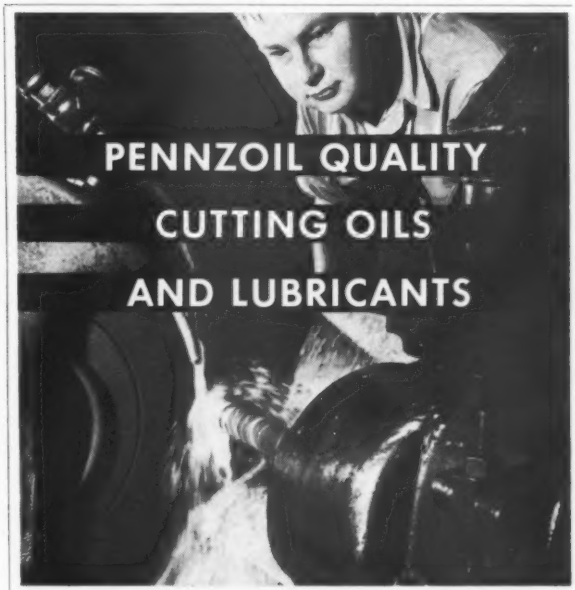


Three small reducers—one miter gear reductor and two worm gear assemblies—have been added to Boston Gear's line of Series 100 speed reducers with its 1,605 different types and sizes. The miter gear has a 1:1 ratio and a horizontal right angle drive, while the ratios of the other two range from 5:1 to 30:1. *Boston Gear Works.*

. . . for more details, circle No. 230 on postcard

WELDING ROD
. . . adds a silver lining

Balancing of silver and nickel content makes EutecRod 1702 a corrosion resistant, low melting (1,175 deg. F.) alloy suitable for fabrication of all types of stainless steel, thin wall tubing and intricate sections where critical heat control is imperative. The silver-bearing alloy comes in seven round and six flat sizes. *Eutectic Welding Alloys Corp.* **. . . for more details, circle No. 231 on postcard**



High V.I. Pennbell, Hydraulic Oil by The Pennzoil Company, non-corrosive, refined to eliminate unstable elements. Holds down machine wear. Supreme in Quality. Pennbell and Maxol—the finest for the machine tool industry. The Pennzoil Company, 942 So. Hope, Los Angeles, Branches and Distributors in principal Western State Cities.

SUPREME QUALITY
PENNZOIL
LUBRICANTS

. . . for more details, circle No. 56 on Reader Service Postcard

LIGHTS, SOUND, ACTION
. . . when acetylene generator deviates

Great commotion sets in when the carbide supply or water level or temperature of this acetylene generator deviates from the normal.

Three independent circuits make up the automatic signal system so that the generator can be equipped with any combination or audible or visual signals for these three conditions.

When not howling and flashing, the generator will produce 1,000 cu. ft. of medium-pressure acetylene per hour from a carbide capacity of 500 lb. *Linde Co., div. of Union Carbide Corp.*

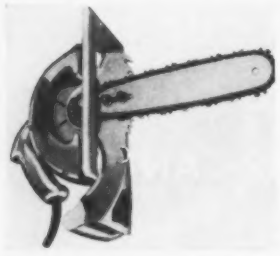
. . . for more details, circle No. 232 on postcard

PORTABLE PAINT PUMP
. . . for production, maintenance work

This Porta-Paint pump handles everything from enamels to strippable coatings directly from 5-gal. containers. Ideal for short run production and metallic base paint applications, the air-powered pump gives fast color change-over because you can operate it in solvent. A 2-to-1 ratio pump delivers a constant flow of material while constant agitation assures color consistency *Stewart-Warner Corp.*

. . . for more details, circle No. 233 on postcard

CHAIN ATTACHMENT
. . . for portable electric saw

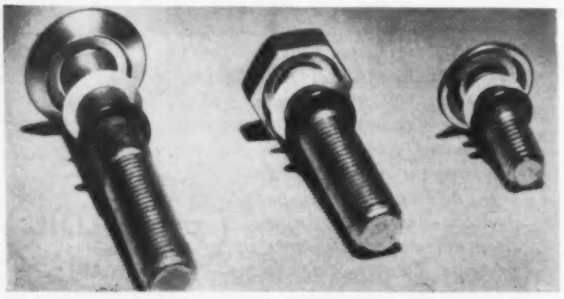


This chain saw attachment for Black & Decker's No. 73 and 83 saws is a safe and easily handled model which forms an integral unit for cutting timber, structural or stacked lumber and for work on other heavy cutting jobs. A wide aluminum shield protects hands and body. *Black & Decker Mfg. Co.*

. . . for more details, circle No. 234 on postcard

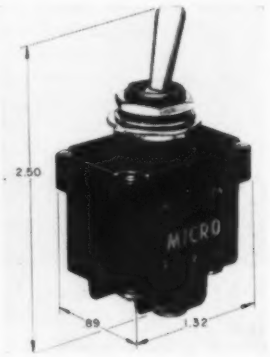
MATING SURFACE
. . . sealed with a fastener

These fasteners, of a new design, seal the mating surface to the head of the threaded fastener yet provide the shear and tensile strength qualities found in their AN and NAS counterparts. The sealing is done by nestling a standard AN or MS "O" ring in the "O" ring groove cold-headed into the fasteners. Fasteners are reusable. *Uniseal Co.*



. . . for more details, circle No. 235 on postcard

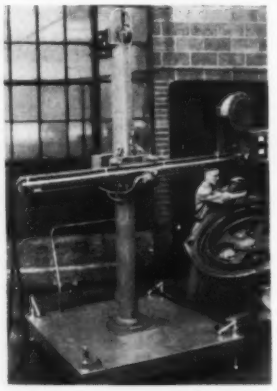
TOGGLE SWITCHES
. . . for aircraft, computer panels



Integral terminal construction and a step-design case make terminals stronger and wiring easier with these toggle switches, which come with all types of standard contact arrangements. A silicone seal between bushing and toggle lever and a non-hardening silicone sealant between cover and case prevent dust or moisture from entering the chamber. This TL series includes single pole, two- and four-pole circuitry models all rated at 20 amp., 30 vdc. resistance load. *Minneapolis-Honeywell Regulator Co.*

. . . for more details, circle No. 236 on postcard

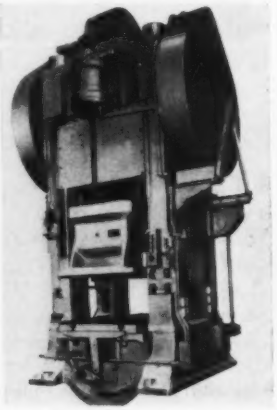
AUTOMATIC MANIPULATOR
. . . pilots welding heads



Designed to position and guide standard automatic welding heads, this mobile Bantab manipulator is best for small production runs or special jobs. They're intended primarily for application with work-holding positioners or turning fixtures and weld straight seams up to 8 ft., providing 8 ft. of under-broom clearance. Welding speeds vary up to 87 in. per min. *Lewis Welding & Engineering Corp.*

. . . for more details, circle No. 237 on postcard

KNUCKLE JOINT PRESS
. . . for multiple, large-size coining



This mechanical double knuckle joint press permits multiple coining and coining of large size or widely separated parts. The double knuckle arrangement—one in front and one in back—produces uniform two-point ram pressure for heavy tonnage operations on a 48 x 84-in. bed. With a 1,000-ton capacity, the K2 press has a nine-station front-to-back transfer feed on 9-in. centers, while feed bar centers are adjustable right to left. *E. W. Bliss Co.*

. . . for more details, circle No. 238 on postcard

EXTENDOCK
. . . transfers wheeled vehicles

This power-operated ramp simplifies the transfer of trucks and such from loading dock to transport vehicles. Extendock is installed in a shallow pit, made in a new dock or cut in an old one, and controlled by a compressed air cylinder. Raising and lowering the outboard end is done by a heavy-duty, single-acting hydraulic cylinder activated by a hand-operated hydraulic pump. Extendock will float as weight changes and support a load of 10,000 lb. *A. J. Bayer Co.*

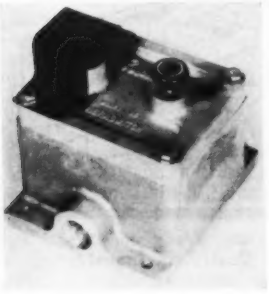
. . . for more details, circle No. 239 on postcard

¼-IN. STEEL TAPE
. . . in chrome-plated case

The Chieftain, a ¼-in. steel rule with 1½-in. square base, has a white metal background with black double edge markings. Upper edge is in sixteenths and thirty-seconds, while the lower edge is in quarters and eighths. A lightweight and sturdy tape of tempered tool steel, it is available in both 6 and 8-ft. lengths. *Disston Div., H. K. Porter Co., Inc.*

. . . for more details, circle No. 240 on postcard

LOW SENSITIVITY DETECTOR
. . . for use with rotating equipment



The Model 65-LS malfunction detector will protect your rotating equipment when it operates with more than normal vibration. The monitoring device, with a range of 0-4.5 G's, comes in an explosion-proof housing and is available with single-pole, double-throw switch and a split contact, normally-open switch. Both are rated at 7 amp., 460-v. a-c. Adjustments can be made without opening the housing. *Instrument Div., Robertshaw-Fulton Controls Co.*

. . . for more details, circle No. 241 on postcard

CLAMP ATTACHMENT
. . . for paper, corrugated rolls

This clamp attachment for Clark's line of fork trucks will handle paper and corrugated stock rolls up to 60 in. in diameter and 6,000 lb. It provides 180-deg. rotation—vertical through horizontal to vertical—so an operator can line up opposite-wound rolls. The unit has oversize clamping and rotating hydraulic cylinders for greater clamping and rotating forces. *Clark Equipment Co.*

. . . for more details, circle No. 242 on postcard

Improved material handling . . . Cont.

staff industrial engineer; (2) the outside engineering consultant; and (3) the qualified factory representative or material handling distributor. And Ed made these points:

> **"A trap lies for the smaller manufacturing plant which hires an industrial engineer to lay out a new plant, or to integrate a modern program. Too often his job is considered by management to be complete when the final layout comes off the boards. Although great care may have been exercised in selecting the equipment for handling, the industrial engineer is not given the authority to place the system into operation . . . your industrial engineer can put a tailor-made handling system in your plant—but it is up to management to make it function!"**

THE ROLE of the material handling supplier was accented when he added:

> **"Don't be surprised if your material handling supplier is a highly qualified engineer, and it shouldn't surprise you too much when he recommends equipment other than his own for the sake of doing a good job for you in your plant. You will find him an excellent source of information on all types of equipment, whether in his line or not."**

The Western regional vice president went on to explain the types of lease plans available and the need for keeping abreast of developments in the handling field. Readers interested in more information should write to: **Ed Sullivan,** 672 S. Lafayette Park Place, Los Angeles 57, Calif.

✔ check the many advantages of

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. . . for more details, circle No. 57 on Reader Service Postcard

BETTER EQUIPMENT *for* BETTER JOBS!

WANT FAST APPROACH,
PLUS automatic change over to lower speed, high-pressure drive that saves plenty of time on every job?

Put **GREENLEE** on your team!

Hook up the Greenlee 798-AC Portable Hydraulic Power Pump to die-presses, arbor presses, test stands—wherever you are now employing hand pumps—for a better, faster job that means more profit-dollars every time!

In stock. Ask us for a demonstration.

★ SALES
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Our stocks include the top lines of industrial and construction equipment.

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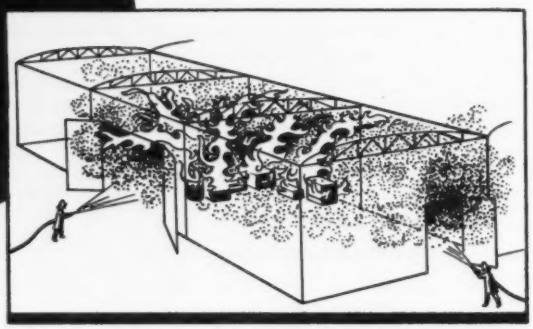
. . . for more details, circle No. 58 on Reader Service Postcard

Your client gets twice his money's worth...

DAY-TO-DAY VENTILATION plus FIRE PROTECTION!



In day-to-day use, the Colt COF/2046 Dual Purpose Fire Ventilator provides efficient, natural ventilation. In the event of fire, a fusible link triggers the ventilator open, providing automatic escape for superheated air and smoke.

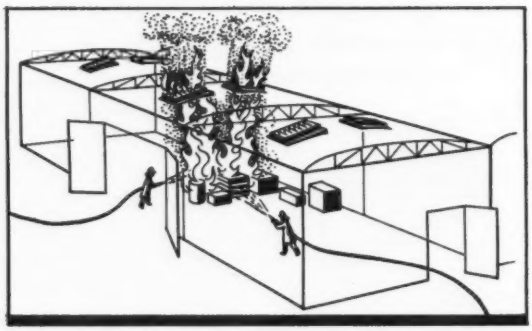
WITH **COLT**

DUAL PURPOSE FIRE VENTILATORS

Unlike most fire protection equipment which serves no useful purpose until an unwanted emergency arises, Colt's new Dual Purpose Fire Ventilators **work every day** in your client's plant. In addition to functioning as a needed and efficient system of natural ventilation, the Colt COF/2046 Ventilators open automatically in case of fire to serve as a heat and smoke exhaust.

Fire authorities throughout the country agree that superheated air, smoke and explosive gases trapped under a roof with no ventilators or natural openings are the main cause of the horizontal spreading of disastrous industrial fires.

When you specify Colt Dual Purpose Ventilators in your client's building you give him **twice** as much . . . ventilation **and** fire protection . . . at no more cost than an ordinary ventilator.



Write today for free copy of "A Lecture on Fire Control in Industry" by M. J. Reaney.

ALSO: Free Technical Manual giving full details of the Colt System and equipment used.

ANOTHER FINE PRODUCT BY

COLT VENTILATION OF AMERICA, INC.

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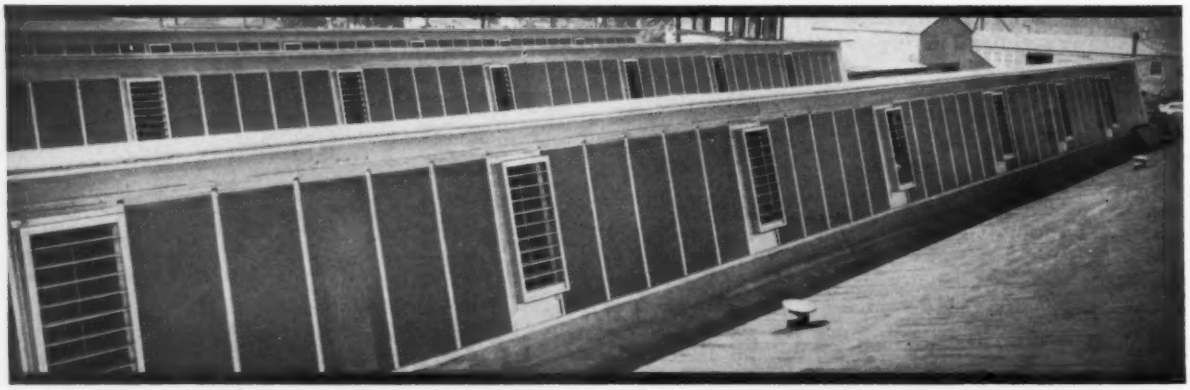
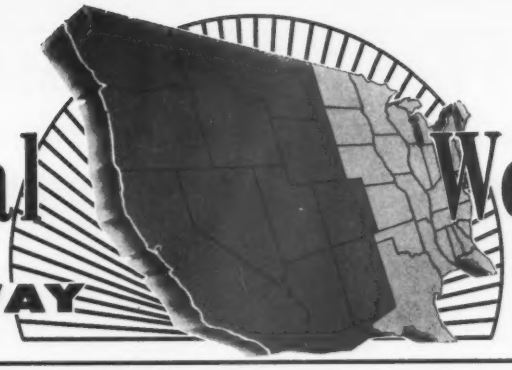


Shown above are some of the 27 CO/2046 Colt Clear Opening Adjustable Louver Ventilators installed in the saw-toothed roof at Nardon Manufacturing Company in Alhambra, California.

. . . for more details, circle No. 59 on Reader Service Postcard

The Industrial West



ON ITS WAY

plants • production • distribution • personnel

Daily Output Is 75 Tons at New Airco Plant

LOS ANGELES—A daily output of over 75 tons of liquid oxygen, nitrogen and argon is scheduled at the new air liquefaction plant recently dedicated by Air Reduction Pacific Co. Business and civic leaders toured the $7,500,000 facility at its dedication and *John A. Hill*, president of the parent Air Reduction Co., Inc., threw the switch which began operations.

Fourth air separation and liquefaction plant to be completed by Airco in recent years, the facility will service industrial, commercial, military and medical clients in Southern California, Arizona and Nevada.

Liquid oxygen from this plant will be used as an oxidizing agent for rocket and guided missile fuel, and in steel producing, foundry, shipbuilding and metalworking industries. Nitrogen will be used for pressure testing and by chemical, electronics and food processing firms. Argon, a rare gas, is primarily for use in electronics and in inert-gas-shielded metal arc welding processes.

Food Machinery & Chemical Gets $51,500,000 Contract

SAN JOSE, CALIF.—Awarding of a $51,500,000 contract to Food Machinery and Chemical Corp. for production of amphibious M59 armored personnel carriers has been announced by the San Francisco Ordnance District. This means good news to some 2,000 subcontracting firms who are FMC suppliers, said *James M. Hait*. FMC vice president and ordnance division manager.

Two Arapahoe Firms Consolidate in Colorado

BOULDER, COLO.—Arapahoe Special Products, Inc., 1970 28th St., has announced that production and sale of all its products are now consolidated with those of the parent company, Arapahoe Chemicals, Inc., 2800 Pearl, Boulder.

The special products firm was organized as a subsidary in 1953 to produce Grignard reagents and chemicals, and to do custom synthesis by the Grignard and similar reactions.

Continental Can Acquires Property in San Leandro

SAN FRANCISCO—Acquisition of a 30,000-sq. ft. building and an adjacent 10½-acre plot of land in San Leandro has been announced by Continental Can Co. The building was formerly owned by Crown Zellerbach.

The transaction, according to *Horace M. Blinn*, Continental Can's Pacific Metal division vice president, is the first step in a long-range program toward expansion of the firm's Alameda County operations. The company now has a 420,000-sq. ft. metal fabricating plant in Oakland.

$1,354,000 Announced in Portland Plant Expansions

PORTLAND—A total of $1,354,000 is represented in warehouse and factory expansion projects announced recently by six local industrial establishments:

- Terminal Ice & Cold Storage Co. will build a one-story, 56,000 sq. ft., reinforced-concrete, refrigerated warehouse at an estimated cost of $500,000.
- Temp-Control Corp. is adding a 28 x 28-ft. second story office to its existing shop at an estimated cost of $10,000.
- Soule Steel Co. plans a one-story 60 x 80-ft. steel frame office building for about $75,000.
- Gresham Berry Growers (Gresham, Ore.) are to put up a 160 x 120-ft., tilt-up concrete storage building representing a cost of $160,000.
- The General Motors Training Center (Tigard, Ore.) is slated for three one-story, 10,000-sq. ft. brick-veneer classroom buildings to cost $100,000.
- Portland Commission of Public Docks plans a 400 x 14-ft. steel frame, wheat-shipping gallery at its Terminal No. 4. Estimated cost is $434,000.

Western Gear Moves Operation to Belmont

SAN FRANCISCO—Consolidation of its Bay Area operations and the approaching move of its industrial division from San Francisco to Belmont has been announced by Western Gear Corp.

Transfer of personnel, equipment and machinery is now under way, with completion of the move scheduled for March 31. About 100 employees will move from the San Francisco quarters at 1035 Folsom St., where the firm has been located since before the earthquake.

Western Gear has a 150,000-sq. ft. facility in Belmont on a 14-acre site at Quarry Road and Industrial Way, where the ordnance division was established in 1950. The industrial division will occupy a building, contiguous to the original structure, which was recently expanded to twice its former size.

Products of the industrial division are gear motors, high speed units for air conditioning equipment, pipe line pumps and other industrial machine items. *Alfred E. Croci* will continue as works manager of the division.

The ordnance division, which employs about 300, is engaged mainly in defense work. *Orm T. Cummings* is works manager. Both divisions will continue to operate individually at Belmont.

The Belmont move was made in the interests of future growth and expansion, Western Gear spokesmen said.

$1,000,000 Expansion at Nestle Coffee Plant

RIPON, CALIF.—Under construction, with completion scheduled for early spring, is a $1,000,000 expansion of the Nestle Co., Inc., instant coffee processing plant here.

The expansion, made necessary by increasing demands for soluble coffee, will consist of a two-story manufacturing plant and one-story warehouse, both to be of concrete blocks with aluminum side paneling. The addition will cover about 300,000 sq. ft.

Automation will be stressed in the advanced design equipment and machinery, which will be installed and ready for operation in October. Because of the new "push-button" techniques, only 12 additional persons will be employed.

IBM Brings Electronically-controlled Warehousing to Auto Parts Firm

ELECTRONICALLY-CONTROLLED warehousing and distribution came to the West when Factory Motor Parts, Inc., installed an IBM 305 RAMAC. Here Charles F. Clayton, left, data processing manager, and Vern A. Culver, MoPar president, watch the radically new computer.

SAN FRANCISCO—If you took a gang of small boys on roller skates, followed by a crew of bookkeepers, plus assorted clerks and other specialized personnel, you'd probably be able to do the job at MoPar now done by RAMAC.

But they'd all have to be pretty speedy, diligent and fantastically accurate to approach at all the performance of this IBM computer and accounting machine that reduces the complicated, time-consuming operations of a wholesale automotive distributing firm to push-button techniques.

How Factory Motor Parts, Inc., wholesale distributor of Chrysler products, uses the fabulous machine to give service plus to its more than 2,500 Northern California customers was demonstrated recently at MoPar's 40,000-sq. ft. warehouse at 1690 Folsom St. The computer is the IBM 305 RAMAC and this is the first production model of the machine to be installed west of Denver and one of the first in the United States.

After an order is received in the phone room at MoPar it goes to RAMAC where, in one processing step, the machine determines if the required part is in stock, whether there is a later model, its location in the warehouse and other data needed for shipping orders and warehouse "picking ticket."

In the same operation, the computer prices the item and figures discounts and sales taxes. It also runs a routine customer credit check and updates all pertinent sales and accounts receivable records with details of the transaction.

RAMAC—Random access method of accounting and control—can also "analyze" sales trends and arrive at an "ideal" stock level for each part. When stock drops below this level, a notification card is punched out, and these cards provide an inventory list. When an order drops the stock to the "dangerously low" level, the computer immediately types out the parts number.

The continuous survey of sales trends and stock levels allows Factory Motor Parts to reduce its inventory to an operating minimum, yet avoid lost sales from lack of stock on hand.

The RAMAC is in a different economic bracket from the huge computers used by utility companies, etc., and is in the medium scale of cost. It is built around a disk memory unit resembling a stack of large phonograph records and has a memory storage capacity of 5,000,000 characters.

Factory Motor Parts, established only five years ago, already had a punch-card system and provided an ideal set-up for the use of RAMAC and for electronically-controlled warehousing and distribution. Other features of the warehouse include bins that fit on fork lifts, a sprinkler system, air-conditioned offices and the use of skylights so that artificial light is needed only about an hour each day during three or four months a year.

McCulloch Plant in Canada

LOS ANGELES—McCulloch Motors Corp. recently dedicated a $2,500,000 plant in Toronto, Ont., for production of chain saws and Scott-Atwater outboard motors.

Precipitation Firm Agents

LOS ANGELES—Western Precipitation Corp., air pollution control firm, has named Process and Power, Inc., as sales agents for an area including Arkansas and parts of Tennessee and Mississippi.

Johns-Manville Plans New Oregon, California Plants

NEW YORK—Two Western plants are among eight scheduled to be in production this year as Johns-Manville Corp. observes its 100th anniversary. The new manufacturing facilities are part of an expansion, modernization, cost reduction and work improvement program in which this manufacturer of building materials and industrial products has invested more than $230,000,000.

The company has also chosen this year to expand its operation into the fast-growing hardboard industry.

The two Western plants are an insulating building board plant at Klamath Falls, Ore., and a Transite asbestos-cement pipe plant in Stockton, Calif. The Oregon facility, the company's sixth plant on the Pacific Coast, has a production capacity of 100,000,000 sq. ft. yearly, using 50,000 cords of pulpwood. With 275,000 sq. ft. of manufacturing space, this automated plant will be operated by 250 employees.

The Stockton plant, situated on 100 acres of land with a 225,000-sq. ft. manufacturing area, will be a mechanized facility with 350 employees

Kaiser Steel's 1957 Output Second Largest in History

OAKLAND—During 1957 Kaiser Steel Corp. produced 1,590,000 tons of steel and 1,335,000 tons of hot metal (pig iron), with shipments of finished steel production totaling 1,044,000 net tons.

All three figures were the second highest in the firm's history, exceeded only by the 1956 record.

A record-setting 1,635,000 tons of coal was produced at Kaiser Steel's mine in Sunnyside, Utah, while iron ore production at Eagle Mountain, Calif., was 2,635,000 tons, slightly less than the record set in 1956. Presently Kaiser Steel is operating at about 90% of rated ingot capacity.

At Fontana, Calif., construction is about two-thirds completed on expansion of Kaiser's steel mill, where production is expected to be nearly doubled when the project is finished in mid-1958. More than 6,000 people are currently working on the expansion project, which will provide additional steel finishing facilities and increase steel ingot capacity from 1,536,000 tons to 2,933,000 tons annually.

Regent Jack Sets up Service, Repair Division

DOWNEY, CALIF.—A service and repair division for complete maintenance of hydraulic jacks and actuating hydraulic cylinders has been established by Regent Jack Manufacturing Co. According to *Edward L. Butler*, president, the new division will be equipped to disassemble, inspect and repair all types of aircraft and industrial jacks and other hydraulic actuating equipment.

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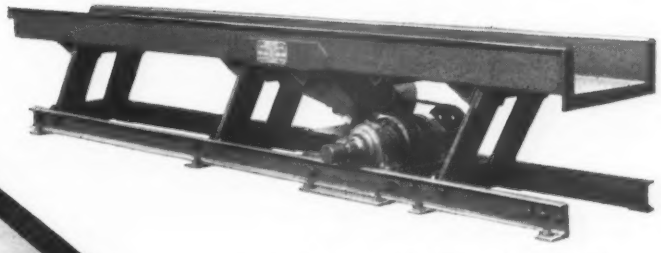

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LMV LIGHTWEIGHT CONVEYOR

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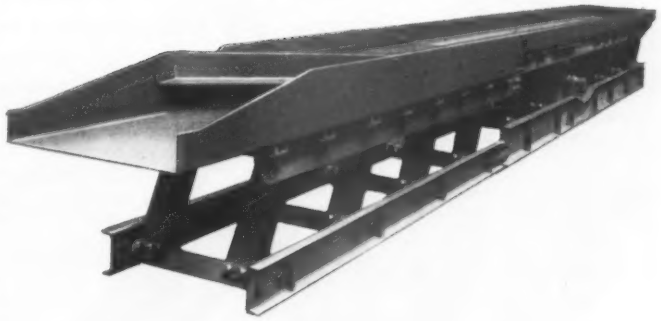

BACK IN 1928 the Traylor Vibrator Company (acquired by Jeffrey in 1933) built the first electric vibrating conveyor, and you know what a tremendous success this line has been . . . feeders, dryers and coolers. Today they're on every class of material—feathers to lead, handling ounces and tons with equal economy and sureness.

In 1948 the men responsible for those electrical conveyors (still with Jeffrey, by the way) turned their attention to *mechanical* vibrating conveying.

First the HMV heavy-duty mechanical vibrating unit was developed—proved highly efficient and dependable, and now accepted as "standard" by all industry. Then came the MMV mechanical vibrating conveyor for medium capacities, but with the many advantages of its predecessor. Finally the lightweight, compact, low-cost LMV completed the Jeffrey line.

Catalog 860-B describes the Jeffrey long line of vibrating conveyors and their application. The Jeffrey Manufacturing Company, 920 North Fourth Street, Columbus 16, Ohio.

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Link-Belt Doubles Facilities

ONE OF THE LARGE MANUFACTURING BAYS in Link-Belt's new Los Angeles plant which gives double the facilities for production of material handling equipment. Officially opened last month, the plant at 1200 Sycamore St., Montebello, Calif., has a manufacturing area 300 x 260 ft., with 42-ft. clearance in the high bay and 29 ft. in the low bays. Layout is arranged for straight-line flow of materials across the building.

Water Freight Service Begins in February

PORTLAND—Alaska Freight Lines will begin barge service between the Pacific Northwest and Gulf ports sometime this month, according to an announcement by the firm. It was granted a "certificate of convenience and necessity" to operate by the ICC after extensive public hearings. A tariff filed with the ICC was effective Jan. 22.

In other action, Alaska Freight Lines revealed that it will soon extend its Seattle-Alaska service to include California ports and Portland. Coastwise Line recently withdrew from that service, although it announced a plan to carry loaded vans northbound from California to be trans-shipped via Alaska Steamship Co. to Alaska destinations.

Robert H. Braun to Handle Disowheel in Los Angeles

LOS ANGELES—The Robert H. Braun Co., 5519 Jillson St., has been appointed local distributor for Disowheel, a roller type wheel used as a replacement for wheels of pallet, platform, narrow aisle, reach and saddle trucks, and for wheels of material handling equipment up to 10½ in. diameter. Available in nearly every standard size, Disowheel will be available at all five of Braun's California locations.

Tacoma Factory Expansion

TACOMA, WASH.—Under construction on a 10-acre tract on Lincoln Ave. and Taylor Way is a factory to expand operations of the Educators Manufacturing Co.

Plant Building Boom Creates More Interest in Packaging, M-H Show

SAN FRANCISCO—Increased interest in the 7th Western Packaging and Materials Handling Exposition to be held here August 11-13 can be credited to the two-year boom in industrial plant construction throughout the Bay Area, according to Clapp and Poliak, show producers.

The record building program, with emphasis on electronics and nuclear energy industries, is making urgent demands on manufacturers of packaging and material handling equipment and methods they pointed out.

Alan K. Browne, San Francisco Chamber of Commerce president, in discussing the electronics industry and its effect on interest in the Exposition, said "This industry is for the most part housed in modern newly constructed facilities, equipped with the latest thinking in material handling and packaging equipment. The almost weekly expansion needs have kept the industry a heavy customer in the new equipment market.

"The sensitivity and delicate nature of many electronic products pose a challenge to creators of packaging equipments, materials and methods," he said.

Ames Co. Completes Move to Larger Facility

MILPITAS, CALIF.—W. R. Ames Co. has announced completion of its move to a newly-built plant on a 50-acre tract here. The new facility includes a 35,000-sq. ft., aluminum pipe fabricating mill, a 30,000-sq. ft. warehouse, a 90,000-sq. ft. loading and storage platform, plus office buildings and space for all administrative activities.

Ames, world's oldest and largest manufacturer of aluminum irrigation equipment, was formerly in a San Francisco location, 150 Hooper St., for 47 years. The company also makes other types of industrial and suction equipment, plus steel library shelving.

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Gov. Knight Addresses Safety Conference

SAN FRANCISCO—Latest statistics about California's on-the-job safety program were given by *Governor Goodwin J. Knight* in his keynote address at the Eighth Annual Statewide Meeting of the Governor's Industrial Safety Conference at the Fairmont Hotel, February 6 and 7. He was heard by some 1,200 leaders of management and labor, as well as other individuals and organizations concerned with on-the-job-safety in California.

Other principal speakers, both nationally known in their fields, were *Sid W. Grimes,* managing director of the Pacific Coast Association of Pulp and Paper Manufacturers, Portland, and *P. L. Siemiller,* general vice president of the International Association of Machinists, Chicago. Grimes spoke on "Management-Labor Cooperation in Safety," while Siemiller's topic was "Labor-Management Cooperation in Safety—Its Problems and Advantages."

The conference, which is held annually and has done much to reduce on-the-job injuries to California workers, represented every occupation and industry in the state. Much of its work is carried on through section committee, with each section comprising persons from a major industry group.

On the February 6 program for the manufacturing section was a panel discussion on "How To Sell Safety," with *Donald L. Truax, Ralph Showalter* and *Father Andrew C. Boss* as panelists and *Ted P. Hedt* as moderator and chairman.

Those attending the February 7 session, for which *Robert E. Mogel* was chairman, heard discussions on "The Value and Importance of Work Injury Statistics" by *M. I. Gershenson;* "Injured Workmen and Their Dependents" by *Edmund J. Thomas, Jr.,* and "Are You Trying to Save Money?", by *S. Kirk Collins.*

Sierra, Columbia Steel Firms Sign Agreement

LOS ANGELES—Faster service and a more immediate source of supply for Western users and distributors of cold finished steel flats and bars are promised with the recent signing of an agreement between Sierra Drawn Steel Corp. of this city and Seattle, and Columbia Steel & Shafting Co., Pittsburgh, Pa.

Under the agreement, Columbia will provide flats up to size 2 x 12 in., finished, and squares and hexagons in intermediate ranges, enabling Sierra to supply customers at Western competitive prices. Sierra currently makes flats up to 1 x 4 in., squares up to 2½ in., hexagons up to 2¼ in., and rounds up to 7 in., plus certain special sections.

Management of the firms will not be affected, nor will Sierra assume the role of Columbia's representative. Before World War II, Columbia served the Western market directly.

Tube Forgings Announces Corporate Name Change

PORTLAND—Effective with the first of this year the name of Clyde Tube Forgings of America, Inc., is changed to Tube Forgings of America, Inc., according to company officials.

Purpose of the name modification, according to management men, was to clearly define the organization as an American corporation.

Tube Forgings, Inc., is one of the major producers of steel welding fittings in the West. Annual production is from 1,500 tons to 2,000 tons of tubular fittings for industrial uses. Distribution warehouses are maintained in Houston, Tex., and Philadelphia.

The corporation's products are seamless steel-tube welding fittings manufactured to America Standard specifications from 100% domestic materials.

CF & I Announces Cut-backs at Colorado Steel Mills

PUEBLO, COLO.—Further cutbacks in operations have been announced at the Colorado Fuel & Iron Corp. steel mills, in addition to the 32-hour work week adopted in some departments in late November.

The present cutback involves a reduced number of shifts worked each week in several departments, including open hearth furnaces, rail mill cutting, 25- and 14-in. mills, rod mill and seamless tube mill. Employees with low seniority will be laid off or transferred to other departments if possible, C. F. & I officials said.

Current employment at the Pueblo mills is about 7,500, as compared to 8,569 a year ago. Peak employment was 9,210, last July.

Join Screw Machine Group

CLEVELAND, OHIO—Three Western companies are among ten recently elected to membership in the National Screw Machine Products Association. They are All Thread Products Co., Los Angeles; Solt Automatic, Van Nuys, Calif., and Walrod Machine Products, Inc., Portland.

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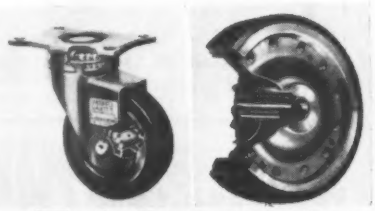

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Demonstrations at Eutectic Center

THIS IS PART OF THE CROWD that turned out to watch live arc and torch demonstrations of latest metal joining techniques when Eutectic Welding Alloys Co. had a three-day open house at its new Warehouse Service Center, 5348 Jillson St., Los Angeles.

Calcor Moves Division, Redesigns Full Line

HUNTINGTON PARK, CALIF.—Celebrating its 62nd anniversary, Calcor Corporation has moved its steel building division into larger quarters, a 100,000-sq. ft. facility on East Gage formerly occupied by Westinghouse.

Largest company in the world to specialize in construction and erection of steel service stations, garages and other commercial buildings, Calcor has extensively remodeled the new plant for semi-automation. New facilities will enable the firm to complete twenty new stations weekly.

Calcor has also announced the redesigning of its full line, with 30 all-new designs and basic plans offered.

†Wisconsin Firm Names Spokane Distributor

SPOKANE—The D. J. Murray Manufacturing Co., Wausau, Wis., makers of GRID Unit heaters, blast heaters and radiators, has named *T. M. Pollard*, E. 2146 8th Ave., as distributor for its products. Pollard will serve the Inland Empire area including 18 counties of Washington, seven counties of Idaho and eight counties of Montana.

Milne to Handle Own Lines

LOS ANGELES—A. Milne & Co., Inc., has established its own warehouse at 4819 E. Patata St., Bell, Calif., for distribution of its line of solid and hollow tool and die steels in this area. Milne products were formerly handled by Taywood Steel.

† 1958 WESCON to Have Two Separate Exhibits

LOS ANGELES—Segregation of WESCON displays into two separate exhibits will be a new feature at the 1958 session August 19-22.

Electronic equipment, test equipment and circuit components will be housed in three buildings, while a fourth pavilion will contain exhibits of electronic production equipment, raw materials and hardware The show will be held at Pan Pacific Auditorium and in three pavilions to be erected.

Increased size of the Western Electronic Show and Convention requires that displays be categorized for easier viewing, according to *Hugh P. Moore*, show director. Another feature will be an official program listing of exhibitors by products, for easier location of specialized items.

Contracts were sent to prospective exhibitors in late January, with applications for booths mailed to arrive at all points simultaneously. Post mark date, as well as priority, are considered in allocating WESCON space. This year's show will have 829 exhibit booths, an increase of 118 over 1956 WESCON.

Harris Named Arizona Distributor for FWS&M

PHOENIX, ARIZ.—Harris Bearing & Supply Co., 729 E. Henshaw Rd., was recently named distributor throughout Arizona for mechanical power-transmission equipment and bulk material handling machinery made by Fort Worth Steel & Machinery Co., Fort Worth, Texas.

Products stocked include many sizes of V-belts sheaves, V-belts, sprockets and roller chains, industrial fans, screw elevators, conveyors and accessories.

Industries served by the Harris firm include cottonseed oil mills, chemical plants, feed mills, air conditioning, etc. The new distributorship was announced jointly by *Mr.* and *Mrs. Ivor W. Harris*, owners, and *Joe Temblador*, FWS&M district sales manager.

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Construction Begins on $3,000,000 Bay Area Industrial Development

SOUTH SAN FRANCISCO—Start of construction on the first two buildings in a $3,000,000 industrial development on Airport Blvd., east of Bayshore Freeway, was announced recently.

The 10-acre development will eventually contain 13 buildings, ranging in size from 9,000 sq. ft. up, and designed for future expansion as necessary.

According to *Louis Poletti*, San Mateo county realtor who is handling the development, agreements have already been signed for two of the buildings, one 17,000-sq. ft. facility and the other, 54,000 sq. ft. Construction on the first began about January 15, with completion scheduled in 60 to 70 days.

The development is planned for all light and heavy industry, Poletti said, with buildings being started at regular intervals so that firms will not encounter delay while facilities are constructed.

Dayton Rubber Creates Urethane Division

HAWTHORNE, CALIF.—Production facilities of The Dayton Rubber Co. have been expanded here and in Marietta, Ohio, with the forming of a new urethane division, created because of rapid sales expansion in the plastic foam field.

Production in the two plants has been stepped up to cover the entire urethane output in both flexible and solid types. Liquid chemicals for foamed-in-place applications are available from both locations.

Basic urethane research and development will be carried on in the Freedlander Research and Development laboratories here. Sales for the new division's Western region will be under direction of *Charles Clark*.

Video Instruments Moves to Santa Monica Site

SANTA MONICA, CALIF.—Occupying new quarters at 3002 Pennsylvania Ave. is Video Instruments Co., Inc., manufacturer of transistorized instruments and power supplies for industrial and military uses.

Formerly located at 2340 Sawtelle Blvd., Los Angeles, the firm moved because of expansion plans, according to *Peter Pohl*, vice president and general manager. Video expects a sharp increase in employment during 1958, Pohl said.

New Headquarters for Ling

LOS ANGELES—New $500,000 headquarters have been occupied recently by Ling Electronics at 9937 W. Jefferson Blvd. The 150,000-sq. ft. building houses administrative, engineering and sales offices as well as manufacturing facilities.

AIME Awards Honor to Donald H. McLaughlin

NEW YORK, N.Y.— *Donald Hamilton McLaughlin* of San Francisco, president of Homestake Mining Co., is one of three engineers awarded the distinction of honorary membership in the American Institute of Mining, Metallurgical and Petroleum Engineers. Presentation of the award will take place at AIME's annual banquet here Feb. 19. A native San Franciscan, Dr. McLaughlin was educated at University of California and Harvard, was formerly a UC professor and has been with Homestake for 30 years.

Big Valves Shipped to India by Portland Firm

PORTLAND—Shipment of 14 huge wedge-gate valves for the Tata Iron & Steel Co., Ltd., of Jamshedpur, India, was recently completed on a 30-day manufacturing schedule by Fabri-Valve Co. The Portland manufacturer took the business from a competing German firm because it could promise shipment within 30 days.

The valves are 28 ft. high and have openings ranging from 40 to 54 inches. They will be used by the new Indian steel mill for the control of gases.

Aircraft Marketing Co.

LOS ANGELES—*R. Gardner* of Aircraft Marketing Co. has inaugurated a new approach to passenger and cargo transport sales, employing an international aircraft multiple listing service similar to that used in real estate multiple listings. Aircraft sales are made through franchise representatives throughout the world, with agents receiving brokers' commissions.

Plastic Co. in Long Beach

LONG BEACH, CALIF.—Under construction at 12th and De Forest Ave. is a 28,000-sq. ft. warehouse and office which will be Western headquarters for National Plastics Products Co. of Odenton, Md. *King Tate* heads the operation.

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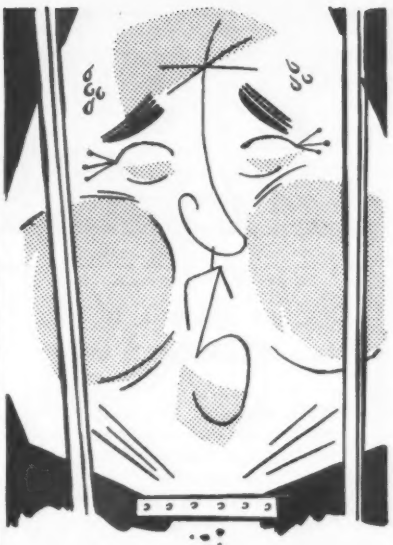
. . . for more details, circle No. 67



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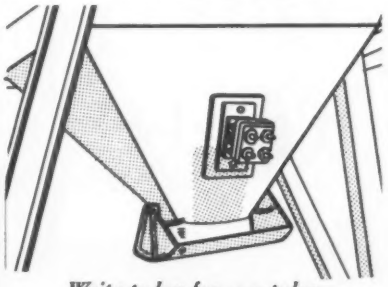

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NEWLY-APPOINTED officers of Foucar, Ray & Simon, San Francisco, are (left to right) **Russ Leonard,** vice president; **H. L. Simon,** chairman of the board; **Sidney H. Diehl,** president, and **E. Herring,** secretary.

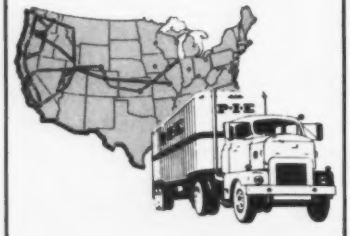
Precision Founders Buys Mars Manufacturing Co.

SAN LEANDRO, CALIF.—Purchase of the Mars Manufacturing Co., San Francisco, was announced recently by Precision Founders, Inc. The acquisition was made to increase capacity for wax injection die making at Precision's new San Leandro plant, said *Edouard C. Thys,* general manager. Mars' former owner, *Mario DeGennaro,* will be die shop manager for the new operation.

Hi-Shear Rivet Tool Co. Adds New Building

TORRANCE, CALIF.—Hi-Shear Rivet Tool Co. has added to facilities on its 14-acre site near Torrance Municipal Airport. Addition is a new building for heat treating titanium and special high temperature alloys, and for experimental processing of new materials.

Shippers Agree... It's P·I·E!



P·I·E

PACIFIC INTERMOUNTAIN EXPRESS

... for more details, circle No. 69

†Fibreboard Sells Eastern Facilities

SAN FRANCISCO—For more efficient concentration on floor covering manufacture at its Emeryville, Calif., plant, Fibreboard Paper Products Corp. has sold its facility at Metuchen, N. J.

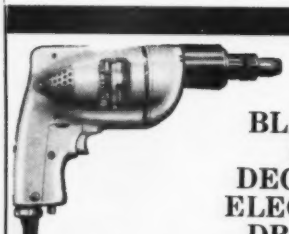
Disposition of the New Jersey property results in a cash increase of more than $7,000,000, plus making available for the Emeryville operation linoleum machinery worth some $1,000,000 said *W. L. Keady,* Fibreboard president. Emphasis on expansion in the company's most profitable operations will be made possible by the increase of cash, he said.

Fibreboard also recently sold assets of its subsidiary, Fibreboard Products (eastern division) Inc., to the Penn-Mar Container Corp.

Taywood to Handle Only Westgrate Products

BELL, CALIF.—Taywood Steel Products, Inc., 4819 East Patata St., has announced it will confine its entire efforts to the fabrication and distribution of Westgrate open steel flooring, discontinuing its handling of the A. Milne & Co. line of tool steel products.

According to *Cy M. Beebe,* vice president, Taywood has added additional sales personnel and increased fabrication facilities to accommodate several new items. These include welded rectangular gratings up to 6 x ⅜ in., on various bearing bar centers and "Heelproof," for use in areas where there is heavy feminine traffic.



BLACK & DECKER ELECTRIC DRILLS

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†New Seattle Furnaces Scheduled to Start

SEATTLE—Scheduled to start production this month is the first of two 100-ton capacity electric furnaces in Bethlehem Pacific's new electric furnace building. The recently-built structure is the largest in the Seattle plant's $25,000,000 modernization and expansion program.

The original plan to have this furnace in operation by the end of 1957 was altered because of delays in equipment delivery. Other phases of the building program are on schedule, and Bethlehem Pacific's management said there will be no slowdown even though the demand for steel is off right now.

"We are confident at Bethlehem Pacific that the current recession in the steel business is only temporary and will improve in 1958," H. H. Fuller, company president, said. "We are going ahead with our expansion and improvement program in Seattle and San Francisco as scheduled.

"In Seattle, we are virtually rebuilding our steel plant and adding 70% to that plant's steelmaking capacity. In San Francisco, we will start to erect our new 16-story office building this year as planned," Fuller added.

Hammerslag Named Lamson Dealer in Bay Area

SOUTH SAN FRANCISCO—Recently appointed dealer for Lamson Mobilift industrial trucks in four Bay Area counties was Hammerslag Equipment Co., 110 Freeway Blvd. Complete parts and service facilities, plus rental and leasing programs, will be maintained by the firm, which also carries casters, electric trucks, dockboards and tiering racks.

Hammerslag, also located at 2643 Toledo Ave., in Santa Clara, will serve San Francisco, San Mateo, Santa Clara and Santa Cruz counties.

Moore Associates Is New Electronics Systems Firm

REDWOOD CITY, CALIF.—Moore Associates, Inc., is the name of a newly-founded electronic systems manufacturing and development company that will specialize in producing transistorized telemetering and remote control equipment for rail, petroleum, chemical and utilities industries.

Located at 2628 Spring St., it is headed by *Albert L. Robinson. James B. Bullock* is vice president, and chief engineer, *Laurence Moore.*

Litton in Salt Lake

SALT LAKE CITY—First unit of a Litton Industries, Inc., electronics plant here is now under construction, with overall completion scheduled for March 1. The 21,500-sq. ft. facility, designed for later expansion to 80,000 sq. ft., will house manufacturing operations for magnatron and klystron tubes.

ESCO, Ltd. Canadian Plant Slated to Open Soon

PORTLAND—The extensive, modern, alloy-steel foundry plant of ESCO, Ltd., Vancouver, B. C., wholly-owned subsidiary of Electric Steel Foundry Co., Portland, which has been under construction during 1957, is scheduled to begin production sometime between mid-February and early March, according to ESCO spokesmen.

The new plant, located at Port Coquitlam, B. C., will be geared to produce alloy-steel castings ranging in size from one-half to 5,000 lb., principally of shock and abrasion-resisting alloys. Said to be one of the most up-to-date on the continent, it has mechanized equipment, electric-arc melting facilities and modern heat-treating and quenching units under precision laboratory controls.

Bill Bailey, formerly manager of Westlectric Steel Castings Co., Los Angeles, will be manager of the Foundry division. He has been in Canada the past year directing the final design and construction of the plant.

Dick Ridgley, formerly superintendent of Electric Steel's Shellcast plant in Portland, has been transferred to Port Coquitlam as superintendent of the new foundry. Melt superintendent is *Bill Stewart* and *Z. R. "Ziggy" Upitis* is in charge of the metallurgical and sand-control laboratories.

C. B. Strong Purchases Fluor-Carbon Division

SAN CARLOS, CALIF.—Fluor-Carbon Coating division of Lindsey Plastics Co. has been purchased by C. B. Strong, El Monte, Calif.

Acquisition was made to establish Bay Area facilities for coating of Teflon and Kel-F. *Robert F. Burnett* is general manager, with headquarters at 952 Center St.

DISSTON

CIRCULAR SAWS

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GM Conducts Tour of Oakland Assembly Plant

OAKLAND—One of a series of tours planned by General Motors during its 50th anniversary year in 1958 was that conducted recently at the Fisher Body assembly plant on Foothill Blvd. where a 42,000-sq. ft. addition was just completed. Members of the Bay Area press inspected various assembly operations and learned that current production is at the rate of 34 passenger cars per hour.

The new addition is a two-floor structure with a storage type roof for body storage. New jigs and fixtures are in operation in the 30,000-sq. ft. body shop.

Hill Transformer Co. Forms New Division

SAN CARLOS, CALIF.—Hill Transformer Co., Inc., 1030 Washington St, has announced establishment of an industrial products division for production of special-duty transformers.

Types and sizes will be manufactured for all industrial applications, with designs developed to individual specifications and units built to NEMA and ASA standards. Hill also makes power and distribution transformers up through 5,000 kva.

Michigan Firm Buys Modern Power Sweeper Co.

AZUSA, CALIF.—Purchase of the Modern Power Sweeper Co. of this city by the Clarke Sanding Machine Co., of Muskegon, Mich., was announced recently.

According to *Ernest Cooper*, Clarke president, production at the Azusa plant will continue for the present, with orders for both machines and service parts handled by the purchasing firm.

Acquisition of the Azusa firm will give Clarke the country's most complete line of floor finishing and maintenance equipment, Cooper said.

A-C Arizona Representative

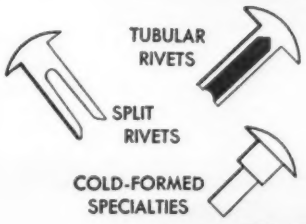
PRESCOTT, ARIZ.—C & C Welding Supply, Inc., has been named a distributor for Allis-Chalmers motors, transformers and "Texrope" drive equipment in Yavapai, Mohave and Coconino counties. The distributor firm is owned by *Charles E. McDaniel*.

New Zipper Tubing Firm

LOS ANGELES—Walter A. Plummer Co., manufacturer of canvas bags and accessories, has formed a new company, Zipper Tubing, to manufacture and market zipper tubing. Location is at 752 San Pedro, same address as the parent company.

COST-CUTTING PRODUCTION TEAM

MILFORD RIVETS and RIVETERS



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Zenith Opens Largest Radome Test Center

GARDENA, CALIF.—The nation's largest private facility for pre-testing reinforced radomes is that opened here recently by Zenith Plastics Co., subsidiary of Minnesota Mining and Manufacturing Co., St. Paul, Minn. Plans have been announced to make the facilities available to industry for rental.

Designed and built by Zenith, large producer of reinforced plastics for the aircraft industries, the new center has facilities for simultaneous testing of up to 18 radomes from the three-story master control center with its six radially-dispersed testing towers. The center provides more room, offers more test controls and produces more accurate test results more quickly than was previously possible, Zenith spokesmen said.

Capacity of the tower makes it possible, on a rental basis, to test other manufacturers' radomes for transmission, reflectivity, beam banding and pattern distortion, said *Charles Peach*, chief electronics engineer.

Standard Conveyor Office

SEATTLE, WASH.—New address of the Standard Conveyor Co office, in charge of Russell G. Daley & Associates, is P. O. Box 1655, Lake City Station, Seattle 55. The telephone number is GLadstone 9009.

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General Controls Creates Electronic Division

LOS ANGELES—General Controls Co. has announced creation of new electronic controls division for missiles, aircraft and industrial production, according to *William A. Ray*, president.

Already in operation at the firm's main Glendale, Calif., plant, the division will design, produce and market high performance analog servos for position and velocity control and control system computation, transistor and magnetic amplifier packages and other military and industrial control devices.

Sales manager will be *John E. Flickinger*, and *Frederick Marsh*, chief engineer.

During 1957 the firm acquired the Hammel-Dahl Co. of Providence, R. I., Production Instruments Co. of Chicago, and the Tork-Master division of Harvill Corp. in Los Angeles. Hammel-Dahl, which joined General Controls in January, produces industrial controls applicable to nuclear power plants and its installations include the USS Nautilus, atomic submarine.

Chemical Plant Alteration

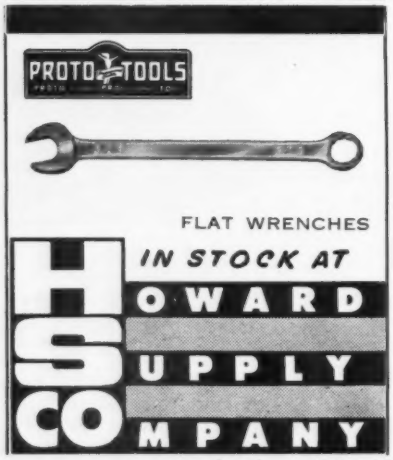
PORTLAND—About $170,000 worth of plant alterations, designed to eliminate fumes and improve production rate and efficiency. is being planned by Chipman Chemical Co., manufacturer of 2,4-D weed killers. Plans and specifications have been prepared by *Robert L. Somerville*, and the work will be done by Singmaster & Breyer, engineers and contractors.

Trewax Expands Plant

CULVER CITY, CALIF.—Scheduled for completion this month is an expansion of the Trewax Company plant that will bring the firm's total area to 20,000 sq. ft. Located at 5631 S. Centinela, the firm manufactures floor waxes.

Pipeline for Uranium

GRANTS, N. M.—Southern Union Gas Co. has started construction of a $250,000 22-mile pipeline to serve four uranium concentrating mills being built in the Ambrosia Lake mining area.



... for more details, circle No. 74

Packard-Bell Acquires Rights to Aerotape

LOS ANGELES—Full rights to Aerotape, a new miniature magnetic tape recorder-reproducer concept, for use in both military and commercial jet planes, have been acquired by Packard-Bell Electronics Corp.

Developed by *John B. Gray*, who recently joined the firm's advanced development section as an electro-mechanical specialist, the transistorized, magazine-loading device is only 4 x 6 x 11 in., and weighs but 10 lb. It is the first modular airborne package permitting, record, erase and playback in a single unit.

Cohu Electronics Buys Two Eastern Firms

SAN DIEGO, CALIF.—Acquisition of two eastern companies by Cohu Electronics, Inc., was announced recently by *La Motte T. Cohu*, president and board chairman.

The two companies, manufacturers of electronic instruments and located in New York, are the Millivac Instrument Corp. and Volkers & Schaffer, Inc.

Both companies, Cohu said, will be merged into a single operating unit to be known as Millivac division of Cohu Electronics, which also operates its KIN TEL division here, and its research and development division in Los Angeles. Electronics instruments for measurement and control manufactured by Millivac will complement the lines already manufactured by Cohu's KIN TEL division.

Harvey Aluminum Is New Corporate Name

TORRANCE, CALIF.—Harvey Aluminum is the new corporate name for Harvey Machine Co., Inc., primary aluminum producer of pig, ingot and billet, and fabricator of wrought aluminum mill products.

The change was made to identify the company more closely with its products, officials said. Harvey operates facilities in California, Oregon and Tennessee, plus factory branches and sales offices throughout the country. Executive offices are at 19200 S. Western Ave., Torrance.

Research Facilities Featured at Telecommunications Lab

SAN FERNANDO, CALIF.—Advanced design facilities for research in air navigation and radio communication and also for studies in fields of infrared, inertial navigation, low temperature physics and solid state physics are features of the new Federal Telecommunications Laboratories here.

Dedication ceremonies were held recently for the 22,400-sq. ft. facility which has superclean areas for assembly and testing of micro-mechanical devices; vapor-controlled areas; a 150-ft. infrared test tunnel, and a sidereal test platform on a seismic block which can stand still in space while the earth revolves around it once each 24 hours.

Castings Manufacturers Form Corporation

LOS ANGELES—The Aircraft Castings Association is a non-profit corporation recently formed in the interests of promoting and developing among aircraft and missile manufacturers the use of ferrous castings made from non-expendable patterns.

Initial members of the group are the Pacific Alloy Engineering Corp., El Cajon, Calif.; Electric Steel Foundry Co., Portland; Stanley Foundries, Inc., Huntington Park, Calif.; Lebanon Steel Foundry, Lebanon, Pa.; Hanford Foundry, San Bernardino, Calif.; General Metals Corp., Oakland, and High Integrity Cast Alloys, Inc., Shreveport, La. Other firms of the same type with necessary facilities and personnel to advance the association's objectives are eligible to join.

Officers elected were *Allen M. Slichter*, president; *Charles E. Haney*, vice president, and *William W. Stevens*, secretary-treasurer.

Employment Picture at Boeing for 1958

SEATTLE—Boeing Airplane Co. expects a "gradual decline" of less than 10,000 persons during 1958 in its Seattle area employment, *William M. Allen*, president, said recently.

Boeing now employs around 60,000 persons in this area.

Rich Steel Co. Opens New Los Angeles Warehouse

LOS ANGELES—Steel suppliers and Western steel fabricators were among the more than 500 persons who attended the open house held recently by Rich Steel Co. to mark completion of its new warehouse at 5930 Bandini Blvd. Tours were conducted through the 30,000-sq. ft. warehouse, in which material flows from back to front, with rail trackage and truck bays at the building's rear to permit inside unloading by 7½-ton bridge cranes. Edging machines, a Bucciconi roller leveler, shearing equipment and modern handling equipment are included in the more than $100,000 worth of machinery installed.

Los Angeles Ordnance Post Has New Officers

LOS ANGELES—New president of the Los Angeles Post of the American Ordnance Association is *Whitely C. Collins*, Northrop Aircraft, Inc. He succeeds *Patrick Lizza* of Bermite Powder Co., who was named chairman of the board.

Serving with Collins are *Rea Hopper*, first vice president; *John B. Rauen*, second vice president; *Gordon B. Crary, Jr.*, secretary, and *Samuel K. Rindge*, treasurer.

Milwaukee Electric Tool Opens Seattle Branch

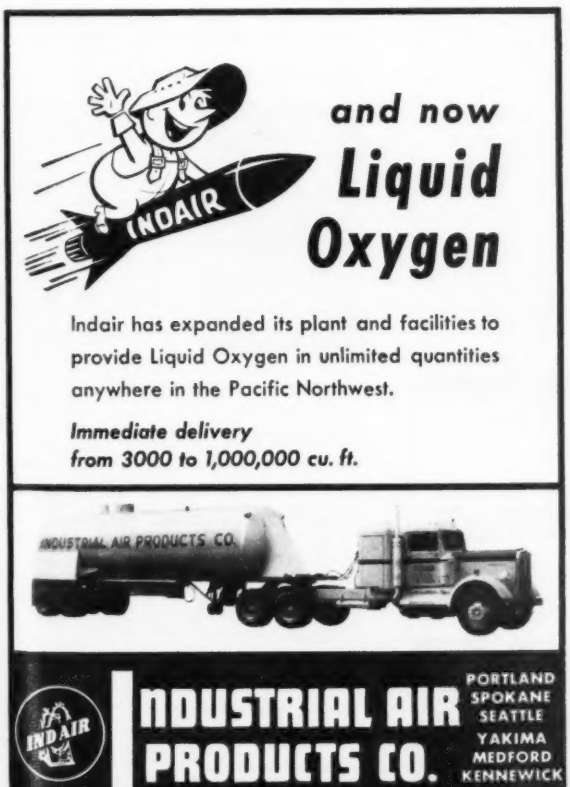
SEATTLE—The Milwaukee Electric Tool Corp., Milwaukee, Wis., has announced establishment of a factory sales branch at 405 Cedar St., to handle Milwaukee Tool sales and repair service for its distributors and their customers in the Northwest territory.

Factory-trained personnel will man this new branch which is equipped with full facilities for electric tool repair service.

Branch manager in Seattle is *Jim Gray*, formerly sales representative in the firm's Pittsburgh, Pa., area. *Frank Martin* will be in charge of tool service and repairs.

Furane Plastics to Handle Sunform Products in West

LOS ANGELES—Furane Plastics, Inc., has announced its appointment as representative for the Electro-Technical products of Nutley, N. J., to distribute Sunform impregnated glass cloth in the Western states. The Sunform line includes impregnated polyesters, phenolics, epoxy and silicones extensively used for tote boxes, drill jibs, radar transparent sections and structural laminates. Other uses are appliance parts, tanks, pre-fabricated construction units, and, for aircraft and missile, fin tops, antenna dishes, fairings, ducts, sonar domes and flare pods.



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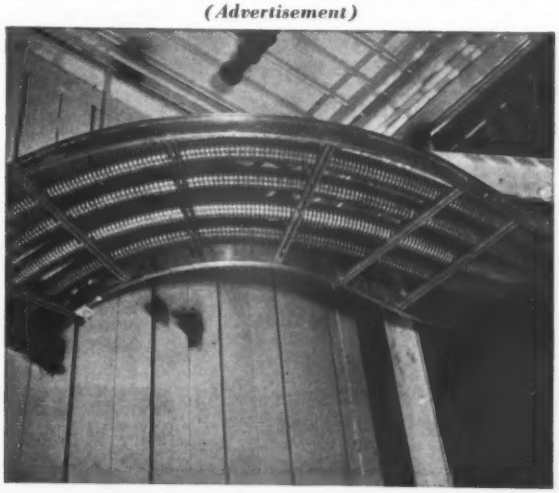

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WESTERNERS AT WORK . . .

Rockwell Manufacturing Co.

. . . recently appointed *Frank E. Sisk* a district sales manager in its Delta Power Tool Division. with headquarters at 3260 Milani Drive, Newark, Calif. Formerly a sales engineer for Southwest Welding and Manufacturing Co., Richmond, Calif., he also has worked for Tidewater Oil and for F. B. Connelly of Oregon.

Aluminum Co. of America

W. J. Jenkins

. . . has transferred *William J. Jenkins* to its Vancouver works from the firm's Cressona, Pa., works. Jenkins has been named fabricating works manager at Vancouver, replacing *J. T. Barclay*, who moves up to a similar post in Indiana.

Minneapolis-Honeywell Regulator Co.

. . . recently added *Karl W. Engstrom* as a sales engineer, industrial division, at its San Francisco branch, 2 Dorman St. Engstrom, who will represent the firm in San Francisco and San Mateo counties, spent 13 weeks in Phildelphia at Honeywell's instrument training school. He formerly was with the Rail Joint Co., in San Francisco for several years.

St. Regis Paper Co.

. . . recognized 106 years of service to its Tacoma mill by five employees when service pins were presented to them by *T. J. Fleischman*. Western district sales manager. A diamond pin went to *R. M. "Russ" Weaver* for 35 years of service. Other awards went to *C. B. Graves*, 20 years; *Roy Curtis*, 22 years; *Don Gillies*, 29 years; and *Lyle Loucks*, five years.

Wagner Tractor Co.

. . . has named *Eddie B. Wagner* to the positions of director, vice president and design engineer in its Portland headquarters and plant. He was, for many years, chief designer of Mixermobile Manufacturers, also of Portland.

Marchant Calculators, Inc.

W. Kassebohm

. . . announces that *Walter Kassebohm* is the company's new chief executive holding the title of executive vice president and general manager. He succeeds *Edgar B. Jessup*, who retired Dec. 31 and is now chairman of the board. Kassebohm has been with Marchant for 19 years as a senior executive, becoming vice president for manufacturing in 1953 and executive vice president in 1956. In his new position he also heads three subsidiaries here, and one in Germany.

Walter R. Cole & Co.

. . . as part of its plant expansion program, has appointed *Aubrey R. Rodgers* to be production manager. Rodgers will be in charge of all factory operations covering the company's line of steel pressure vessels, tanks, stacks, and other products. Before coming to Oakland, Rodgers was employed at Lukens Steel Co. in Pennsylvania.

Electronic Welding

. . . of Burbank, Calif., has a new plant manager, *Kenneth L. Madden*, who comes to the company from Seattle where he was with Boeing and with Sweeden Freezer Mfg. Co. His duties will include direct supervision of all plant operations in Electronic Welding's fabrication program.

Yale & Towne Mfg. Co.

. . . has named *Gordon H. Winters* to represent its sales and service branch in the Oakland-Southern Alameda county area, and has added *Charles H. Fowler* to its sales staff in that area. Winters has been

G. H. Winters

C. H. Fowler

with the San Leandro branch for the last two years and has spent more than 12 years in the lift truck and material handling field. Fowler has had nine years' industrial sales experience in the Bay Area, including seven years representing the Skil Corp.

Pacific Intermountain Express

. . . has announced recent personnel changes in Oakland and in Portland, *L. R. Toburon*, a P.I.E. employee since 1949, has been named Pacific region operations manager, headquartered at Oakland. In Portland, *I. L. Leeson* was selected as dispatcher at the motor carrier's terminal. Leeson was with West Coast Fast Freight, Inc., before its merger with P.I.E.

Another announcement concerns the appointment of *J. D. Sandlin* as district fleet maintenance supervisor at the Seattle terminal. Sandlin joined the trucking firm in 1948 and has been serving the past six years in its general shops at Denver as service floor superintendent.

Chainveyor Corporation

E. P. Russell

. . . has a new division manager of its Western division, *Edward P. Russell*, who has been manager of project engineering for Chainveyor the last three years. Well-known in the material handling field, Russell was formerly with Gladding - McBean Co., and also an industrial consultant in Pasadena, Calif.

Ramo-Wooldrige Corp.

. . . has announced *Irwin A. Binder's* appointment as vice president for manufacturing. Binder was formerly assistant general manager of the Tapco plant of Thompson Products, Inc., Cleveland. In his new post, Binder will be responsible for coordinating all corporation manufacturing efforts for the firm in Los Angeles and Denver. His offices will be at Los Angeles headquarters.

Kaar Engineering Corp.

. . . has promoted *Norman C. Helwig* to the vice-presidency of the Palo Alto electronics firm. General manager since 1952, Helwig will continue in that post. He has been with Kaar since 1940 and previously worked for General Electric Co.

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PLUMB

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Easterday Supply Co.

W. Dreyer

. . . has news of staff changes in San Francisco and in Los Angeles. In San Francisco *Robert H. Barr* has been named administrative assistant to *Robert Friedenthal*, general manager. In Los Angeles, *William Dreyer* has been selected as Southern California sales manager of the sanitation supply company. Barr was formerly with the Di Salvo Trucking Co., and Yellow Cab Co. Dreyer has been with Easterday since 1946.

Lamson Mobilift Corp.

. . . announces election of *Karl C. Schmedicke* as vice president and general manager, and *Keith L. Ross* as treasurer and manager of sales. Schmedicke has been manager of manufacturing at the Portland firm for the last year, after three years as plant superintendent for Lamson Corp. in Syracuse, N. Y. Ross has been assistant treasurer for the past four years.

Beam Products Mfg. Co.

. . . reports two additions to its staff—*David W. Reber* and *R. L. "Dick" Mefferd*. Reber, located in Lansdale, Pa., has been appointed Northeastern regional manager for

D. W. Reber

R. L. Mefferd

Beam L-P Gas carburetion quipment. Mefferd's appointment is to the position of service manager, with headquarters at the Los Angeles factory.

J. M. Loge Sound Engineers

. . . names *Jack Logan* sales representative in northern California for its Kwik-Kall intercommunications systems, to serve both jobbers and industrial accounts. Logan recently opened his own office, following a nine-year association with Logan Sales Co. 256 Magellan Ave., San Francisco.

Kaiser Steel Corp.

. . . has announced *Jdmes A. Maggetti's* appointment as assistant plant manager of the Napa, Calif., plant. Maggetti will be responsible for sales, production and some administrative duties, as well as continuing to manage the plant's planning and estimating department. He has been with Kaiser since 1955, after working for the Basalt Rock Co., former owners of Kaiser's Napa and Fontana plants.

National Lumber Manufacturers Ass'n.

. . . has elected *Walter M. Leuthold*, Deer Park, Wash., lumberman, as its chairman of the board.

CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are ⅛ inch short of contracted space to allow for borders and composition. Rates are $15.50 a column inch. Copy should be sent in by the 25th of preceding month if proofs are required; by the 28th if no proofs are required.

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Cascades Plywood Corp.

. . . makes known the selection of *Don G. Baxter* to head the new Reedsport, Ore., division which was formed from Cascades' purchase of the Reedsport mill and timber holdings of the E. K. Wood Lumber Co., recently. Baxter has been manager of the E. K. Wood operations at Reedsport for the past six years.

Consolidated Electrodynamics

. . . in its Datalab division, has had major appointments of interest. *Joseph M. Martin, Sr.* was named manager of the design department and *Paul L. Ashway* appointed manager of fabrication service. Martin was formerly with Servomechanisms, Inc., Bendix Pacific and Burroughs. Ashway was previously an executive of William Miller Instruments, Inc., of Pasadena, acquired by CEC last spring.

The Foxboro Co.

. . . has established a new sales region in the Rocky Mountain area and opened a branch office in Denver. *Joseph M. Temple* has been appointed manager of the new region, with headquarters in Denver and supervision over branch offices there, in Salt Lake City, Kansas City and Omaha. *Paul C. Jones* was appointed sales engineer for the Denver area. Temple has been with Foxboro since 1949, Jones since 1954.

Ducommun Metals & Supply Co.

B. J. McFeeley

. . . reports that *B. J. "Ben" McFeeley* is the new sales manager for its Northern California division and will direct sales activities of the firm's Berkeley facility. McFeeley has been with the division's sales department for the last three years.

Ampex Corporation

. . . has created a new post—manager of engineering—in its instrumentation division, and selected *Winfield Heinz* to fill it. Formerly coordinator with the division, Heinz has had 30 years experience in instrumentation, automatic control and process engineering; has published many professional papers and has been granted several patents.

Weyerhaeuser Steamship Co.

. . . gets a new president in the person of *Donald Watson*, of San Francisco, and a vice president in *L. J. Rogers*, of Tacoma, according to an announcement by *F. K. Weyerhaeuser*, president of Weyerhaeuser Timber Co., Tacoma.

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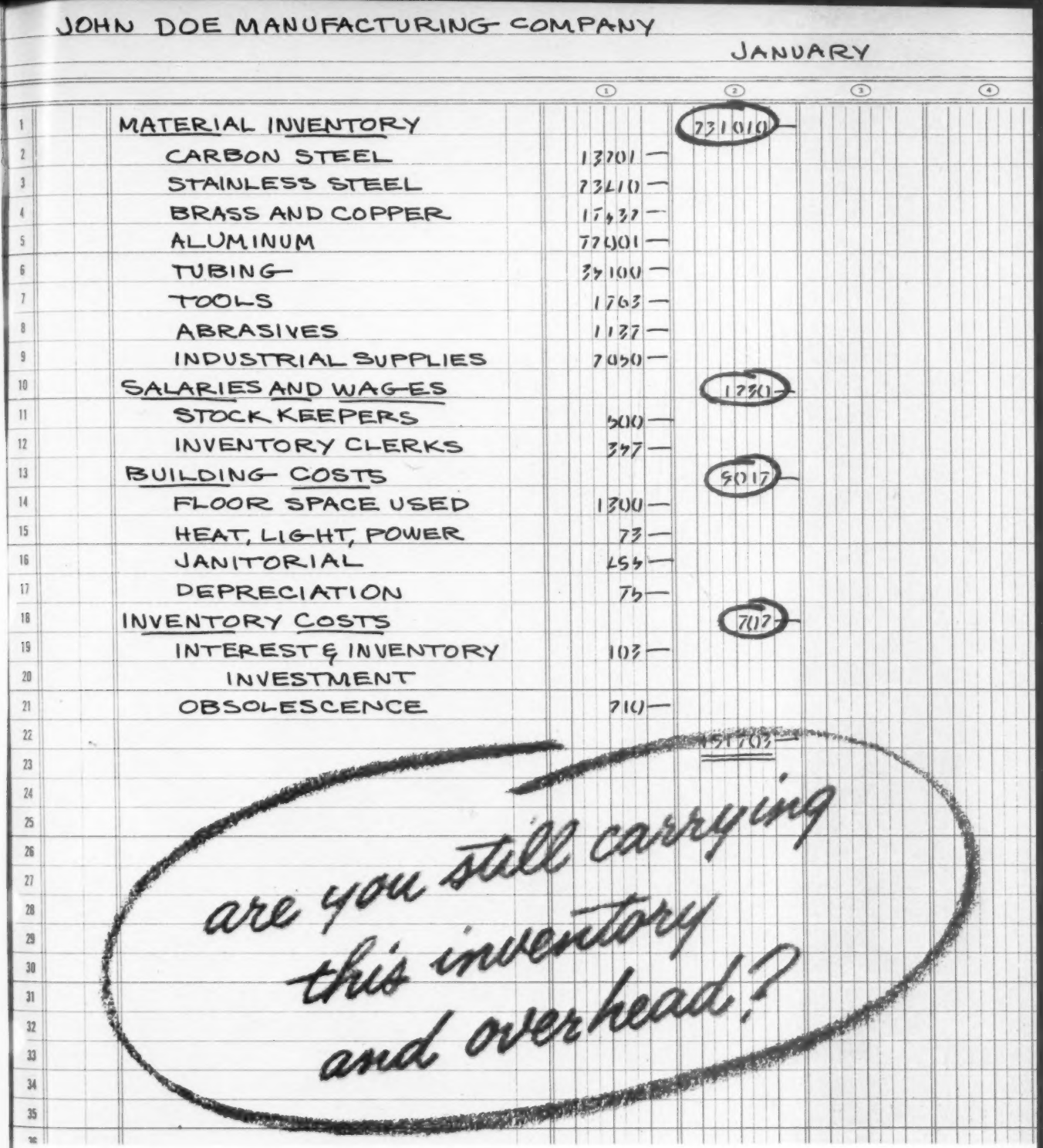

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